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ANNUAL REPORT OF THE

SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES

FOR THE FISCAL YEAR

1914

WASHINGTON
GOVERNMENT PRINTING OFFICE
1914

Treasury Department,
Document No. 2731.
Public Health Service.

LETTER OF TRANSMITTAL.

Treasury Department,
Office of the Secretary,
Washington, December 7, 1914.

Sir: In accordance with section 9 of the act of Congress approved July 1, 1902, "An act to increase the efficiency and change the name of the Marine-Hospital Service," I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1914.

Respectfully,

W. G. McAdoo,
Secretary.

The Speaker of the House of Representatives.

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OPERATIONS OF THE UNITED STATES PUBLIC HEALTH SERVICE.

1914.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE.

Treasury Department,
Bureau of the Public Health Service,
Washington, D. C., October 10, 1914.

Sir: In accordance with the act of July 1, 1902, I have the honor to submit for transmission to Congress the following report of the operations of the Public Health Service for the fiscal year ending June 30, 1914. This is the forty-third annual report of the service, in the one hundred and sixteenth year of its existence.

Under authority of the act of August 14, 1912, the activities of the service have been greatly extended during the year, and the appropriation by Congress of a fund for "field investigations of public-health matters" has made possible the undertaking of much important work along scientific lines.

The administrative supervision of the work of the service is conducted through the seven divisions of the bureau as follows:

(1) Scientific research and sanitation.
(2) Foreign and insular quarantine and immigration.
(3) Domestic (interstate) quarantine.
(4) Sanitary reports and statistics.
(5) Marine hospitals and relief.
(6) Personnel and accounts.
(7) Miscellaneous.

As previously stated, a number of investigations have been carried on during the year, and some of them completed. Others will be continued as may be necessary. All of these activities will be described under subsequent appropriate headings.

Beriberi at Elizabeth, N. J.

At the request of the local health authorities, Passed Asst. Surg. H. B. Parker was directed to proceed to Elizabeth, N. J., in order to determine the character of several cases of sickness that had been occurring in the county jail located at that place. The symptoms mentioned by the local health officer in his correspondence with the bureau seemed suggestive of beriberi and Dr. Parker's attention was invited to this point.

Dr. Parker arrived at Elizabeth November 6, 1913, and after examining in company with the jail physician three of the cases then in hospital, they were found to be suffering from beriberi. All the prisoners serving sentences of 60 days or more were afterwards examined in the jail and three more cases of beriberi were found among them. The short-term inmates were not examined.

During the last three previous years the jail physician had diagnosed as edema 22 cases, which seemed to Dr. Parker strongly suspicious of beriberi. There is a history of the same disease having occurred periodically in the jail during the last 10 or 15 years, it being the opinion of the jail physician that at least 80 per cent of all prisoners serving more than 90 days had been contracting it.

The fact that beriberi existed so long in this institution without recognition indicates that it may exist under similar circumstances in other penal establishments in other parts of the country.

The complete report of Dr. Parker's investigation was published in the Public Health Reports of February 6, 1914.

Diphtheria Studies in Detroit, Mich.

In compliance with a request received from the city health officer of Detroit, Mich., previously approved by the State Board of Health of Michigan, Surg. J. Goldberger was, on November 20, 1913, ordered to proceed to that city for the purpose of advising the local authorities in regard to the control of an epidemic of diphtheria then prevailing in Detroit.

Surg. Goldberger, after conferring with the city health officer, found the situation presenting two problems: (1) Control of the epidemic itself; (2) possible defects in the bacteriological laboratory of the health department. It was with respect to the second condition that the city health officer desired immediate advice and assistance.

On investigation it was found that there had been something radically wrong in the methods used by the city bacteriologist during previous months for the examination of diphtheria cultures. In fact, the conclusion seemed inevitable that release cultures had been thrown away at the laboratory without examination and negative reports made on them. This professional misconduct, leading, as it did, to the premature discharge from quarantine of many individuals still carrying and excreting more or less virulent diphtheria bacilli had undoubtedly been a factor in the unusual prevalence of the disease in Detroit. On the strength of these facts the bacteriologist was summarily dismissed by the city board of health.

In connection with the control of the diphtheria epidemic, preliminary tests appeared to show an extraordinary number of "carriers." This required the adoption of restrictive measures somewhat different from those conventionally practiced. Accordingly it was advised that the eight-day quarantine period in vogue be continued, and that in addition two successive negative throat and nose cultures be required for release or in lieu of these negative cultures a certificate from the family physician certifying to the complete clinical recovery of the patient, the absence of clinical evidence of disease in the "contacts," and that all had received immunizing doses of diphtheria antitoxin. In the case of school children and teachers, however, this option was not allowed, two successive negative cultures from nose and throat (combined) being insisted upon. This regulation appeared to work well, and a marked reduction in diphtheria was brought about and has continued in Detroit since.

Laboratory studies.—The epidemic just referred to in Detroit afforded special opportunities for intensive studies of the disease. Surg. Goldberger was therefore authorized to organized a temporary office and laboratory for the purpose of collecting diphtheria specimens and determining the frequency of healthy carriers, the influence of their presence on methods of control, the decrease of virulence of different strains of organisms, and other related questions.

Asst. Surgs. C. L. Williams and J. Bolton were detailed to assist in this investigation, and the services of two bacteriologists, one visiting nurse, and the necessary office force were also secured. The investigation was conducted in Detroit from December 18, 1913, to March 9, 1914, after which date the laboratory studies and analyses of the data assembled were continued in the hygienic laboratory at Washington. During the field work 9,482 cultures from over 4,188 individuals were collected and examined, and about 250 cultures were transferred to the hygienic laboratory for further intensive studies as to virulence, etc. It is expected to embody the results of these studies in a special report, which will probably be published as a hygienic laboratory bulletin.

Endemic Goiter in Appalachian Mountain Regions.

Reports having reached the State board of health of West Virginia of the unusual prevalence of endemic goiter in some of the mountain counties in that State, the secretary of the board requested, in August, 1913, that an investigation should be made by the service into the subject. Surg. T. Clark, who was then conducting studies of the prevalence of trachoma in West Virginia, was therefore directed to make such observations as might be practicable in regard to the prevalence of goitre in the localities visited by him.

West Virginia and Virginia.—Among 13,836 school children examined by Dr. Clark in the counties of Boone, Cabell, Fayette, Kanawha, Logan, McDowell, Mercer, Mingo, Raleigh, Wayne, and

Wyoming, W. Va., 1,234 cases of goiter were found, or 8.91 per cent. A similar examination was made in Virginia, and 817 cases (12.7 per cent) were found in 6,432 school children in the counties of Buchanan, Carroll, Dickenson, Grayson, Lee, Scott, Smyth, Washington, and Wise. Not one case of cretinism was observed among these persons.

Of these cases, less than one-tenth of 1 per cent of goiter was among schoolboys, girls being mostly affected. The counties in Virginia and West Virginia underlaid by carboniferous strata had the lowest percentages of goiter, remarkably lower than those in the limestone section. A very noticeable endemicity of goiter was found along the course of the New River, which rises near the Virginia-North Carolina line, flows northeast through Grayson and Carroll Counties, Va., and continues into West Virginia, in a northwesterly direction.

As a result of his studies, Dr. Clark was inclined to conclude that the extensive prevalence of the disease in rural communities, where families are widely separated and have different water supplies, tends to preclude the possibility of the infection being due to a water-borne living organic excitant. It can, however, bear some relation to the water supplies, there being a possibility that the affection is caused by a deficiency of certain chemical substances.

Dr. Clark's complete report has been published as Reprint No. 184 from the Public Health Reports.

North and South Carolina.—In connection with a study made in the mountainous sections of North and South Carolina to determine the prevalence of trachoma, observations were made by Passed Asst. Surg. A. D. Foster, also to determine the prevalence of endemic goiter.

During a period of six months, from December, 1913, to June, 1914, 16,805 persons were examined in the States of North and South Carolina for trachoma, and at the same time note was made of the occurrence of goiter in these individuals.

Opportunity was also taken to observe as many persons as possible in the various towns visited, on the streets, in churches, and other places where the town people usually congregate. Wherever possible, practicing physicians were interviewed, and statements were obtained from them as to the prevalence of goiter.

In the course of the examination of school children, only two cases of goiter were observed. One of these was seen in the public schools at Asheville, N. C., and one at Florence, S. C. The latter case, however, could not be classed as occurring in the mountainous section of the State.

Two cases of goiter were observed at Waynesville, N. C., although it is not known whether these were native residents of the town or visitors.

In only one locality, Dillsboro, Jackson County, N. C., was goiter reported to be endemic. In this place, which is a small mountain village with a population of 277, four cases of goiter were seen. Three were cases of simple goiter in negroes, and one was a case of exopthalmic goiter in a white woman. All the cases were females. One of the cases stated that her sister and grandmother who lived in the same section also had goiter.

A physician practicing in the village stated that he had frequently observed cases of goiter among the neighboring mountain population.

As a result of his observations, Dr. Foster was inclined to believe that goiter was infrequent in the mountainous sections of North and South Carolina, with the exception of a limited area in Dillsboro, N. C., and its vicinity.

Eastern Tennessee and Northern Georgia.—In the course of a survey of the mountainous sections of eastern Tennessee and adjoining mountainous counties in Georgia to determine the prevalence of trachoma and other infectious diseases, observations regarding the prevalence of goiter were made by Acting Asst. Surg. C. W. Bailey. During the survey 19 counties in eastern Tennessee and 8 counties in Georgia were visited and a total of 22,542 persons were examined.

As a result of his observations, Dr. Bailey noted 188 cases of goiter in 19 counties of Tennessee, and 15 cases in 8 counties of Georgia. The number of cases in the several counties referred to varied from 2 to 45 with the exception of Hawkins and Sullivan Counties, Tenn., in which many additional cases were seen and reports obtained of others.

It is intended that the results of these observations will be published with such details in respect to location as have a bearing on the subject.

HOOKWORM DISEASE.

During the fiscal year the service has continued to cooperate with the various State boards of health and the Rockefeller Sanitary Commission in the movement for the eradication of hookworm disease. The activities of the service officers in this work have been chiefly devoted to research and technical matters as they were prior to the formation of the sanitary commission and the active campaign by the State boards.

The same 11 States, mentioned in the report for 1913, have been working along definite lines during the fiscal year, and representatives from the various State boards, from the commission, and from this service have met at various times to discuss the problems involved and to make the campaign as uniform as practicable.

During the year 1913, 186,277 persons were treated, making an average of 616 persons for every working day in the year. This is a slight decrease below the treatments for the preceding year.

The total number of persons to whom treatment has been given during the years 1910 to 1913, in the 11 States in question, is 539,107. The total number of microscopic examinations reported thus far is 858,377.

Degree of infection among school children.—In determining the degree of infection among school children, there have been examined thus far in 413 counties in 11 States a total of 415,250 children, of whom 180,374 persons, or 43 per cent, were found infected with the parasite.

Soil pollution.—In the sanitary survey to determine the degree of soil pollution in rural districts, 501 counties have thus far been examined. The total number of homes inspected was 189,586, and the following results were obtained, showing a sanitary index of 5.8 per cent.

Number of privies—		
Type A, at 100 per cent	412	41,200
Type B, at 75 per cent	550	41,250
Type C, at 50 per cent	692	34,600
Type D, at 25 per cent	4,788	119,700
Type E, at 10 per cent	87,156	871,560
Type F, at 0 per cent	95,998	0
Total number homes inspected	189,586	1,108,310

Sanitary index, 5.8 per cent.

CONTAMINATION OF FOOD WITH FECAL MATERIAL.

Some of the service officers who have been engaged especially in field work have long been convinced that a considerable portion of the population in very large areas consumes, by accident, more or less human excrement, but there was no recognized method by which this point could be scientifically demonstrated.

A method for this purpose has been evolved by Prof. Stiles in the Division of Zoology, Hygienic Laboratory, and practical tests have now been made in quite a large number of people. This method starts from the point of view that there are certain animal parasites, Entamoeba coli, Lamblia, Trichomonas, Ascaris lumbricoides, and Trichuris trichiura, found in the human intestine, but are not known as parasitic in animals other than man. These particular parasites enter the human intestine only through the mouth. The transmission from person to person occurs either in spore or egg form. These spores or eggs leave the intestinal tract in the excrement; there is no free-living stage. Therefore, any person who has in his intestine one of these parasites must have obtained the infection through swallowing human excrement.

The Division of Zoology has recently applied this test to 2,372 persons, chiefly children, taken at random in 12 different localities in 3 States, and has proved by use of the protozoan tests alone that of the 2,372 persons examined a total of 425 persons, or 17.9 per cent, responded positively. In addition to the foregoing examinations, specimens not included in these statistics have been tested with positive results from other States.

From a strictly symptomatic point of view this determination of the ingestion of excrement is of little direct medical value, but it would appear that this test presents a method of great value in a practical campaign for an improvement of sanitary conditions.

In one locality the service has made a practical test of using this method and of notifying the parents as to the findings. Following these notifications, a very healthy sentiment in favor of sanitation developed, and while it is not claimed that this sentiment was due entirely to the letters sent out, information is to the effect that the notices had a great deal of influence. The service is now testing the method in several other places in order to determine, if possible, how far it is of practical application in public health campaign work.

MALARIA INVESTIGATIONS.

The antimalarial work referred to in the last annual report (p. 33) has been continued and extended. In addition to Alabama, the activities of the service along this line were extended to the States of Arkansas, Connecticut, Florida, Georgia, Louisiana, North Carolina, South Carolina, Tennessee, Virginia, and Pennsylvania (city of Erie).

Surg. J. H. White, assisted by Asst. Surg. T. J. Liddell, was in charge of the work in Louisiana until March, 1914. Surg. R. H. von Ezdorf was in charge of the work in the other States until April 24, 1914, when he was ordered, at the request of the Secretary of the Navy, to proceed to Vera Cruz, Mexico, with the naval forces. Since April 30, 1914, Senior Surg. H. R. Carter has been in charge of all the antimalarial work. He has been assisted by the force previously under Surg. von Ezdorf, namely, Asst. Surg. R. C. Derivaux, Asst. Surg. Liddell (for work in Louisiana), Technical Assistants H. A. Taylor and D. C. Molloy. Since May, 1914, Sanitary Engineer J. A. Le Prince has also been employed in this connection, and the services of a biologist were available during a short period.

In all the States the work has been conducted in cooperation with the State health authorities, its objects being: (1) Collection of mortality and morbidity statistics; (2) malarial surveys of selected localities to ascertain the malarial index, breeding places of anopheles, and suggesting antimalarial measures; (3) educational campaign by means of lectures, lantern-slide demonstrations, and publications.

MALARIA STATISTICS.

The first step taken was to secure the available morbidity and mortality statistics. Mortality statistics were available for only two of the Southern States—Alabama, beginning with the year 1910, and Mississippi, beginning with November, 1912. For the purpose of obtaining morbidity statistics and other data bearing on the prevalence of the disease in 1913 circular postal cards were mailed to physicians in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee.

From only one-sixth of these physicians were answers received. The data obtained have been tabulated by counties for each State. Cases were reported for each county in the States of Alabama, Arkansas, and Mississippi; all counties, except one each from which no reports were received, in Florida and South Carolina; all counties, except six from which no reports were received in Tennessee; for 138 of the 148 counties in Georgia, and 63 of 100 counties in North Carolina. In Alabama and Mississippi the disease prevails during the entire year.

All three types of malarial infection were reported in the eight States mentioned, the tertian type being most prevalent. Florida and Mississippi were the only States where the quartan type has been confirmed in State laboratories. Of the 99,003 cases of malaria reported for 1913, 29,240 cases (29.53 per cent) were in children under 15 years of age.

The data for Arkansas have been published as Reprint No. 160; for Florida, Georgia, and South Carolina as Reprint No. 172; for

Mississippi as Reprint No. 193, and for Alabama as Reprint No. 186 of the Public Health Reports.

Similar data were collected for Alabama, Arkansas, Florida, North Carolina, South Carolina, and Tennessee for the first three months of the year 1914. Less than one-seventh of the physicians addressed sent replies, no reports being rendered for 50 of the 433 counties circularized in these six States. Cases were reported for 49 out of 64 counties in Alabama, 61 out of 71 counties in Arkansas, 35 out of 39 counties in Florida, 73 out of 96 counties in North Carolina, 37 out of 44 counties in South Carolina, and 56 out of 93 counties in Tennessee. Out of 9,402 cases reported for the period mentioned 2,685 (28.56 per cent) were among children under 15 years of age.

MALARIA SURVEYS.

A number of malarial surveys were made during the year by Surg. von Ezdorf in certain localities in Alabama, Arkansas, and North Carolina, namely, Anniston, Leeds, Montevallo, and Plateau, Ala.; Augusta, Lake Village, Pine Bluff, Scott, and Stuggart, Ark.; and Edenton, Elizabeth City, Greenville, Knotts Island, Newbern, Roanoke Rapids, Rockingham, and Washington, N. C. A malarial parasite index from blood examinations was made in all these places, and a total of 5,079 people examined. The percentage of infection varied considerably in the different places, the lowest being 1.8 per cent at Plateau, Ala., and the highest at Rockingham, N. C., 31.75 per cent.

Electrical Mills, Miss.—After considering local conditions and communicating with State and local authorities, Senior Surg. H. R. Carter selected a number of places in which to conduct active antimalarial work. The first work of this character under his direction was undertaken by Technical Assistants Taylor and Molloy on May 10, 1914, at Electrical Mills, Miss., a typical sawmill village in a very malarial region. Blood smears were made by them from 527 individuals, 62 of them, somewhat over 11 per cent, being found positive. The larger proportion of the cases was among colored people. As a number of people had had attacks of malaria and taken quinine earlier in the month, it is fair to assume that the true malarial index was in excess of what the blood examinations showed. The presence of nearly 12 per cent of malarial carriers at the end of the winter season was considered rather large and very instructive.

For this reason and to study closely malaria-producing conditions in the locality Dr. Carter, accompanied by Sanitary Engineer Le Prince and Technical Assistant Molloy, proceeded subsequently to Electrical Mills, devoting three days to a malarial survey. A plan in detail was drawn for the sanitation of the mosquito-breeding places which had been found. The physician of the sawmill company showed great interest in the work and expressed a willingness to carry out all the measures which had been advised.

Columbus, Ga.—During June, 1914, a survey was made of Columbus, Ga., under Dr. Carter's direction, with a view to determining the conditions responsible for the causation of malaria and recommending to the authorities practical methods for their elimination.

The Culex mosquito was found to be breeding in enormous quantities in a number of streams and creeks heavily polluted with sewage. Anopheles were breeding freely in clear water in a number of places in or adjacent to the city.

A report, accompanied by a map indicating mosquito-breeding places, was made to the city board of health and city council embodying recommendations as to the work that was necessary to correct existing conditions.

Greenville, S. C.—A careful malarial survey was made of this town, anopheles punctipennis being found breeding freely. The local authorities and mill owners in the adjacent territory expressed a desire to carry out the work recommended for the control of malaria.

Eau Claire, S. C.—A similar survey was made of Eau Claire, an incorporated suburb of Columbia, S. C., the main species of anopheles found being crucians and maculipennis.

Hartsville, S. C.—A survey was made, and a report as to the measures necessary was rendered to the city authorities and board of health.

Sumter, S. C.—A careful survey was made, and recommendations for antimalarial work were presented.

Roanoke Rapids, N. C.—Sanitary Engineer Le Prince visited Roanoke Rapids, N. C., to observe the progress of the antimosquito work done in that locality and to advise the authorities as to further measures which should be adopted.

All the places visited by Dr. Carter and his associates were selected on account of the ability and willingness of the authorities to carry out the antimalarial work which might be recommended. Special pains were taken to make these surveys thorough and the recommendations as specific and practical as possible in order that not only would the communities themselves benefit by this expert advice but also to have them serve as demonstrations to similarly situated towns of the advantages of antimosquito work and the feasibility of undertaking it.

It is intended to visit all these places subsequently in order to take note of the progress made in the work recommended.

MALARIA IN NORTH CAROLINA.

At the request of the State board of health and others, Senior Surg. H. R. Carter was directed to visit a number of towns in the eastern part of the State of North Carolina for the purpose of securing data on the prevalence of malaria and advising in regard to the prevention of the disease.

Dr. Carter's investigations began on August 10 and continued until September 17, 1913. Acting Asst. Surg. J. R. Rodman joined Dr. Carter at the first place visited in North Carolina and accompanied him during the entire trip. Elizabeth City, Hertford, Edenton, Plymouth, Washington, Greenville, Newbern, Goldsboro, Fayeteeville, Smithfield, Tarboro, and Roanoke Rapids were visited.

The general plan of work at each of these places was to see the health officials and with them to make a general malaria survey of the town and its immediate environment. This survey was made to examine probable breeding places for Anopheles mosquitoes, and to demonstrate their larvæ in situ to the local health officials, showing them (1) in what kind of places such larvæ were and were not to be found, (2) how to distinguish them from the larvæ of other mosquitoes, and (3) how to secure them.

Before, in the intervals of, and after this survey the local physicians were seen, and their statements secured as to the prevalence of malarial fever and its character both at present and in former years. Their views on the general problems of malarial fever were obtained and discussed. During the survey, if the health officer was present, as was the case in all but one town, the appropriate remedy was pointed out for each place breeding Anopheles: Draining, tile or open ditch, as appeared applicable; filling, oiling, and poisoning with waste of mills. Recommendations were also made for cleaning off brush and weeds where needed.

After the completion of this work, an exposition was made of the condition of the town as regards malarial fevers, with recommendations for the remedying of such conditions as required remedy.

The object was not only to acquire information of the condition of the town by this survey, but to show the health officer everything possible, so as to increase his efficiency, and above all to incite and direct public opinion so that the health officer might be able to institute and carry out successful antimalarial measures for his town.

Properly speaking, no survey of malarial conditions in the towns visited was made either as to number of cases or variety of parasites. It was rather a survey, and a careful one, of the causes of the malarial conditions that did exist, and especially an attempt to remedy such conditions.

At no place were any definite statistics obtainable as to the prevalence of malarial fever, not even as to its comparative prevalence or its virulence.

In the absence of statistics, it can be stated that there is much malaria in eastern North Carolina, mainly of a rather mild type, tertian, but there is some of the estivo-autumnal type. There was some malaria in every town visited, but much more in the country, and of severer type than in the towns. Indeed, a severe type, including much blackwater fever, was reported in several counties and small towns, none of which were, however, visited. These reports were from practitioners in Plymouth, Washington, Newbern, Goldsboro, and Fayetteville, who practice in the places where the severe type prevails.

No estimate based on deaths reported from malarial fever seemed worth making, because (1) the rates of death to morbidity vary so widely in different locations; (2) in children the death is quite frequently from an intercurrent affection and is reported under that head; and (3) the prevalence of a "continued fever not affected by quinine," which is by some practitioners considered typhoid and by others malarial, and the deaths therefrom would be reported by the latter as malarial fever.

On one thing, however, all the older practitioners of the tidewater towns are agreed, viz, that malarial fever is far less prevalent and less severe than it was 20 to 30 years ago.

The recommendations made for antimosquito (Anopheles) work in all sections were along these general lines, varying, of course, in detail for each community according to local conditions: First remove the brush, weeds, and high grass from all places which may possibly be breeding places for mosquitoes, e. g., marshes, ditch banks, etc. Next get rid of the breeding places (*a*) by removing the water or (*b*) rendering it unfit for breeding.

In small towns and rural communities as much antimosquito work was recommended as seemed practicable, and individual prophylaxis was advised to supplement or substitute it. This was the use of methods to prevent access of mosquitoes to human beings and to render those to whom they do have access insusceptible or less susceptible to infection. The first was the use of screenings and mosquito bars. The second was the use of prophylactic doses of quinine. Its advantages and the methods and form of administration were described and illustrative instances and statistics given.

Dr. Carter's complete report, with special reference to each of the places visited, has been published as Reprint No. 156 from the Public Health Reports.

Kinston, Morehead City, and Jacksonville, N. C.—At the request of local authorities, approved by the State board of health, Prof. C. W. Stiles was detailed in October, 1913, to visit the towns of Kinston, Morehead City, and Jacksonville, in eastern North Carolina, for the purpose of collecting data in regard to breeding places of mosquitoes and delivering some lectures in regard to the prevention of malaria.

Quite a number of varieties of mosquitoes were collected, namely, aedes calopus, aedes sollicitans, aedes trivitatus Say, Anopheles punctipennis, culex pipiens L., Culex quinquefasciatus Say, Culex restuans Theobald, Culex salinarius Coq., Culex territans Walker, Psorophora (Janthinosoma) columbiae. Breeding places were found in tin cans, barrels, boxes, buckets, kegs, stagnant water, and boats.

The mosquito problem in the places visited was divided into two phases—internal and external. The internal problem related to breeding places in or in the immediate surroundings of the town, the external to more distant breeding places, such as marshes, etc. Attention was invited to the need of determining the relative importance of these two problems in attempting work for mosquito eradication.

In his opinion, local breeding places could be easily eliminated in most cases. In many instances tin cans, bottles, and similar containers thrown into the yards were breeding mosquitoes, which could have been avoided by exercising the simplest precautions. The elimination of the intraurban mosquito problem in the three places visited by Prof. Stiles was, according to him, a very simple problem, depending only on the cooperation of the citizens, the enforcement of antimosquito ordinances, and the expenditure of a relatively small amount of money. The solution (drainage) of the extraurban mosquito breeding places seemed to him complicated by agricultural, engineering, and economic questions, and it seemed probable that quinine prophylaxis and screening of houses might make the undertaking, if not unnecessary, inadvisable on account of the cost.

SANITARY SURVEY OF GREENWICH, CONN., WITH SPECIAL REFERENCE TO MALARIA.

At the request of the health officer of Greenwich, Conn., supported by the secretary of the Connecticut State board of health, Surg. J. W. Schereschewsky was detailed to make an investigation of the sanitary condition of that town and borough, with special reference to determining the causes of the reported excessive prevalence of malaria. The investigation lasted from August 7 to August 20, 1913.

The following phases of the local sanitary situation were considered: Prevalence of malaria; prevalence of typhoid fever and other communicable diseases; water and milk supplies; excreta and waste disposal; and pollution of Long Island Sound, in the vicinity of Greenwich, with special reference to the oyster industry.

It soon became evident that malaria of the tertian variety was very prevalent in the town and borough. This prevalence was due to the existence of numerous breeding places of anopheles mosquitoes, imperfect screening of houses, and the presence of human malaria carriers. While drainage operations and oiling of catch basins and standing collections of water were being carried out, it was pointed out that these would have little or no effect on the malarial situation on account of failure to exterminate anopheles mosquitoes.

Typhoid fever was found to be not unduly prevalent in Greenwich at the time of the investigation. Should the infection, however, be introduced either in the water or milk supply, no measures were in force to prevent its wide dissemination.

Certain defects were noted in the water supply with respect to the watershed, which was found exposed to pollution, and to the filtration process, which was lacking in efficiency.

The milk supply was found to be far from satisfactory. Of 19 establishments inspected, only 2 could be characterized as good, 5 as fair, the rest being decidedly bad. The conditions surrounding the production and handling of this product provided in most instances abundant opportunity for the dissemination of milk-borne communicable diseases.

The sewerage system was inadequate to the needs of the community. While the borough was sewered, insanitary privies were common in the sewered and usual throughout the unsewered area. The method of disposal of garbage and household wastes, other than excreta, were found to be inefficient and insanitary, most of the work being done by private agencies.

The waters of Long Island Sound, in the vicinity of Greenwich, were found grossly polluted with sewage, this pollution being of special interest on account of the near location of oyster beds and the practice of bathing in the Sound.

The sanitary administration of the town and borough was inadequate through the lack of sufficient health appropriations, proper compensation of the health officer, and the necessary health legislation.

Specific recommendations were made by Dr. Schereschewsky to correct the various defects noted by him, a copy of his report having been furnished to the local health officer. These recommendations dealt in detail with the prevention of malaria; the improvement of the water supply; the securing of a safe milk supply; sewage and garbage and waste disposal; organization of an efficient health organization; abatement of nuisances; and establishment of a system of medical inspection of schools.

MOSQUITO PREVALENCE AT ERIE, PA.

At the request of the Member representing Erie and vicinity in Congress, and with the knowledge of the State commissioner of Pennsylvania, Sanitary Engineer J. A. Le Prince was directed to proceed to Erie, Pa., to examine the mosquito-breeding places in the locality, with special reference to Presque Isle, and to advise the authorities as to measures for their eradication to prevent malaria.

Mr. Le Prince was at Erie from May 19 to May 22, 1914, during which time he surveyed Presque Isle, giving special attention to that part of the island opposite Erie and near Misery Bay, Waldamere Lake and Park, and certain parts of the city proper. The conditions favoring the breeding and development of mosquitoes were noted everywhere. Conferences were also had with the mayor, commissioner of fisheries, water supply and public health authorities, and other persons interested.

The results of this investigation were embodied by Mr. Le Prince in a detailed report, with specific recommendations for the adoption of certain measures deemed best by him for the eradication of mosquitoes in the places visited. Copies of this report were furnished to the local authorities for such action as they might deem advisable.

GENERAL EDUCATIONAL WORK.

In addition to the surveys mentioned, and in connection with them, a number of lectures and demonstrations were given by Drs. von Ezdorf and Carter and assistants at the places visited. Specimens of larvæ and pupæ were also collected and exhibited to audiences at meetings. In a few cases, classes of school children were taken out on searches for mosquitoes and taught to identify Anopheles larvæ.

A number of educational bulletins have been prepared for use in the antimalarial campaign. The titles of those published to date are as follows: What the Farmer Can Do to Prevent Malaria; Prevention of Malaria; Screening as an Antimalarial Measure; Quinine Prophylaxis for Malaria; Malarial Index Work, Methods Used in Obtaining Blood, etc.; and Malarial Lessons for Schools.

MALARIA, A NATION-WIDE PROBLEM.

As may be seen from the preceding data, the prevention of malaria and mosquito reduction are acute problems in many parts of the country. The lack of knowledge regarding the remediability of these conditions and failure to take necessary measures of prevention tax heavily the sanitary and economic interests of many communities.

It has been the experience of the officers engaged in this work, however, that when the conditions causing the prevalence of malaria and the measures necessary to control them are brought to the attention of the people concerned, prompt action usually follows on their part.

It has been estimated by various students of the subject that the prevalence of malaria is causing this country an annual loss of many millions of dollars, while its deteriorating physical effects are felt by hundreds of thousands of persons.

There seems to be little doubt that the realization by the people of this enormous loss will serve to bring about a great improvement in this respect, and that they will supply funds with which to put in operation important preventive measures. All the antimalarial work of the service has therefore been planned with these ends in view: First, to make the communities visited understand the situation; second, to give practical advice to correct the defects noted.

Pellagra Investigations.

The pellagra investigations referred to in the last annual report (p. 28) were continued and considerably enlarged, following the appropriation by the sundry civil act of June 23, 1913, of the necessary funds for field investigations of public health matters. A further appropriation of $47,000 for a temporary field hospital and laboratory for special studies of pellagra was carried in the deficiency act of April 6, 1914. The latter appropriation is being used for the equipment and maintenance of a hospital and laboratory at Spartanburg, S. C., using for this purpose a building offered by a local firm at a nominal rent.

At the conclusion of the fiscal year, intensive pellagra work was being conducted by the service at the following places: Savannah, Ga.; Spartanburg, S. C.; Georgia State Insane Asylum, Milledgeville, Ga.; Mississippi Orphans' Home, Jackson, Miss.; and the Hygienic Laboratory, Washington, D. C.

On April 6, 1914, Surg. C. H. Lavinder was relieved from duty in connection with pellagra work, and Surg. J. Goldberger placed in general charge of the investigations, with temporary headquarters in Washington, D. C. At the end of the fiscal year the following personnel was in addition being employed in this work: at Savannah, Ga., Passed Asst. Surg. J. R. Ridlon, in charge of administrative matters and supervision of work; Surg. E. Francis, devoting his time to laboratory studies of the disease, 2 acting assistant surgeons, 2 clerks, and 6 attendants; at Spartanburg, Passed Asst. Surg. R. A. Herring, in general charge, 1 acting assistant surgeon, 1 pharmacist, 1 biochemist, 2 assistant biochemists, 1 dietitian, and 12 attendants; at Milledgeville, Ga., 1 psychiatrist, 1 technical assistant, and 3 clerks; at the Mississippi Orphans' Home, Jackson, Miss., 1 acting assistant surgeon; and at the Hygienic Laboratory, 2 special experts under the direction of Prof. C. Voegtlin, Chief of the Division of Pharmacology.

At Savannah, Ga., arrangements were made to admit, in addition to the male patients at the marine hospital of the service, white female patients at the Savannah Hospital and colored female patients at the Georgia Infirmary. During the year a total of 151 patients were thus observed and treated; 42 (male) at the marine hospital, 93 (white female) at the Savannah Hospital, and 19 (colored female) at the Georgia Infirmary. Eight persons were also treated as outpatients at the dispensary.

The lines of study pursued at Savannah are: 1, inoculation of animals (more than 100 monkeys in addition to rabbits, white rats, and mice) with material obtained from pellagra cases, with a view to securing data in regard to the infectious theory of the disease; 2, microscopical examination of feces to detect any unusual parasites and of the urine to detect the presence of indican; 3, clinical studies of the cases in the hospital; 4, anaerobic culture studies.

At Spartanburg, S. C., the work has likewise assumed two phases—observation of pellagra patients and special metabolic studies at the hospital established toward the end of the fiscal year. During the year a total of 285 patients were thus observed and treated in Spartanburg, 246 treatments administered at the dispensary and 766 treatments administered at the homes of pellagrins. Twenty-nine of the patients treated at Spartanburg were transferred for further treatment to Savannah.

At the Spartanburg hospital and laboratory it is intended to carry on certain metabolic and dietary studies which have been planned by the Chief of the Division of Pharmacology, Hygienic Laboratory, with a view to determining the influence of diet on the course of the disease, the effect of certain drugs on the symptoms, the biological characteristics of the bacterial flora of the upper intestine of the patients, and also to applying the knowledge gained through experimental studies at the Hygienic Laboratory. A biochemist, who is also an expert in dietics, and the necessary nursing staff, has immediate charge of the dietary studies, while the medical officer in charge of the station, assisted by an assistant surgeon, is responsible for the clinical examination of the patients and their treatment.

At the Georgia State Insane Asylum, Milledgeville, Ga., a study of the psychic manifestations and of the cytology of the cerebrospinal fluid in pellagra cases was conducted by Special Expert W. F. Lorenz since January 1, 1914, the work being nearly completed at the end of the fiscal year. In connection with these studies, toward the end of the fiscal year arrangements were made to place a number of patients at the sanitarium under a special diet to observe its effect on mental manifestations of the disease.

At the same institution an epidemiological study is now being conducted by Technical Assistant D. G. Willets under the direction of Surg. Goldberger for the purpose of securing data on the incidence of pellagra in patients at the asylum. A preliminary study of the same character was also made by Acting Asst. Surg. C. H. Waring under Dr. Goldberger's direction at the Government Hospital for the Insane, Washington, D. C., and it is planned to undertake similar work at other institutions in the hope that it may throw light on the nature or continuance of the disease.

At the Mississippi Orphans' Home, Jackson, Miss., for instance, arrangements have been made for systematic epidemiologic and dietary studies, this institution having been selected on account of location, age of inmates, etc. This work is being conducted by a junior medical officer under the direction of Surg. Goldberger.

Through the Division of Pharmacology of the Hygienic Laboratory special studies have been conducted for some time under the direction of Prof. Voegtlin, with special reference to the influence of certain food and drugs on manifestations of the disease and changes made by it in certain tissues. As a part of this research special chemical studies of brain tissues have been made by an expert in organic chemistry. Another organic chemist has made numerous analyses of various foods, the results of which have been published in the Public Health Reports of June 19, 1914. In the Public Health Reports of June 26, 1914, there was also published a brief note on the significance of certain epidemiologic observations in respect to the etiology of pellagra.

Smallpox in Upperville, Va.

At the request of the State commissioner of health of Virginia, Surg. T. Clark was instructed on August 21, 1913, to visit Upperville, Va., to inspect three families suspected of having smallpox. Among them, five cases of the disease in active form and three recovered cases were found by Dr. Clark. The origin of the disease was unknown, since the earliest cases had not been recognized.

On Dr. Clark's arrival the entire town was under quarantine and general vaccination of the population was in progress. Dr. Clark recommended that the vaccination of the inhabitants should be completed, the quarantine of the entire town lifted, and strict quarantine only of the infected premises maintained until terminal disinfection was practiced.

Trachoma in the Appalachian Region.

The investigations of the prevalence of trachoma referred to in the annual reports for 1912 (see p. 27) and 1913 (see p. 27) were continued during the year. A survey of the Appalachian region south of Maryland and Pennsylvania was conducted by a number of officers to determine the extent of the spread of the disease. The object has not been the detection of every case of trachoma in the places visited, but to outline the limits of infected territory and to bring to the attention of local physicians, school boards, and other authorities the dangers of this disease, following its introduction into communities, and the necessity of concerted action for its eradication. The examinations were confined almost exclusively to the school population. House to house inspections, however, were made in certain localities.

WEST VIRGINIA AND VIRGINIA.

In the mountainous sections of West Virginia and Virginia these investigations were carried on by Surg. T. Clark from September 23 to December 20, 1913, and from April 13 to April 29, 1914. In West Virginia 23 counties were visited and 340 cases of trachoma found among 20,848 persons examined, or a rate of prevalence of 1.63 per cent. In Virginia 10 counties were visited and 7,801 persons examined. Of these, 108 (1.38 per cent) had the disease.

A total of 199 public and private schools were inspected during this survey, 68 in Virginia and 131 in West Virginia. Of these 22 were schools for colored children. In addition, the schools for the blind and for the deaf and dumb at Romney, W. Va., and at Staunton, Va., were inspected, and also the inmates of the West Virginia State Prison, at Moundsville. House-to-house inspections were made in certain mining districts and two rural communities of West Virginia.

A significant fact revealed by the survey was the wide distribution of trachomatous infection throughout the greater portion of West Virginia, from Parkersburg, in Wood County, on the northwestern border of the State, south and east to and including Mercer and Summers Counties. On the other hand, no trachoma was found in the eastern end of the State from Hampshire County, in the north, to and including Monroe County, in the south.

In Virginia the heaviest infection was in the counties adjoining the known infected territory of Kentucky and West Virginia, in the southwestern part of the State. A sharp line of demarcation, represented by the Clinch Mountains, separates the infected from the noninfected counties in that section of the State.

No definite information could be obtained in the course of this survey as to how long trachoma has existed among these isolated people. Many and varied speculations are entertained by different persons respecting the origin of trachoma among them.

In this survey 2,338 negroes were examined at 21 different points in the two Virginias and only two cases of trachoma were found among them. These findings show that while the negro is not immune to trachoma, the amount of infection, under apparently identical conditions, undoubtedly is much less in the negro than in the white race.

The impression is quite general in West Virginia and elsewhere that trachoma is very prevalent among the foreign element of the population. The belief is not confirmed by this survey. Trachoma is there essentially a disease of the native population. The foreigner is a negligible factor in the continued prevalence and spread of the disease in these two States.

Special attention was paid by Dr. Clark to the conditions in the mining industry. It was found that the prevalence of trachoma among the miners was largely a matter of location, the degree of infection being determined by the amount of the disease in the territory where they resided or came from. Through the tendency of miners to drift from one location to another they may prove, however, a factor to be considered in spreading trachoma.

The contagiousness of trachoma was quite clearly shown by Dr. Clark's survey. The disease is most prevalent in isolated communities, far from medical attention and indifferent to the same, except in sudden and grave infections. Until recently but little effort has been made to control the disease. As a result, it was not uncommon to find instances where the infection had spread from one person to another in the same family.

In some communities every family of a common name was infected. In individual families the infection varied from two or more members to the whole family. In several instances the source of family infection had been definitely traced to a previous more or less protracted visit of some person subsequently known to have been affected with trachoma.

In a number of communities the question of poverty entered less into the consideration of the cause of the spread of trachoma than did the personal habits of a considerable number of the people.

The type of the disease met in the two Virginias did not, as a whole, appear so severe as that found in Kentucky and among the Indians in previous investigations by officers of the service.

NORTH AND SOUTH CAROLINA.

The investigations in regard to the prevalence of trachoma in North and South Carolina were made by Passed Asst. Surg. A. D. Foster, and lasted from November 26, 1913, to April 22, 1914.

Dr. Foster visited 21 counties in the mountainous sections of North and South Carolina and 5 counties in the lowland section of South Carolina, and examined a total of 16,805 persons. Among these only 34 cases of trachoma were found, 33 among 10,680 persons examined in North Carolina, and 1 among 3,325 persons examined in South Carolina. As a whole, there was a remarkable absence of the disease as compared with the mountainous sections of Kentucky, Virginia, and West Virginia.

Most of the cases found were among the Indians of the Cherokee Reservation in Swain County, N. C., from whom trachoma has spread to some extent to the white population residing in the neighborhood. The disease was also present among the native-born population of Mitchell and Caldwell Counties, N. C.

The examinations were confined almost exclusively to school children, although a number of employees in cotton mills were also examined, and in certain localities house-to-house inspections were made. In these inspections, numerous cases of folliculosis, blepharitis, and keratitis were discovered.

An inspection of as many colored schools as possible was made. Among 2,324 negroes examined in 16 schools in North and South Carolina, only 1 case of trachoma was found, in Wake County, N. C.

While the population in the mountain sections of North and South Carolina is almost exclusively native born, advantage was taken of the presence of a number of Scotch and North Italians employed in a quarry in Surry County, N. C., to examine them. Examination was also made of children of Greek and Syrian extraction in the lowland section of South Carolina, but in none was trachoma found.

In order to stimulate interest in the work, simple talks were delivered at the various schools visited. As a result of his investigations, Dr. Foster recommended that systematic inspections should be made of all school children in North and South Carolina in order to determine whether trachoma is present, and that prompt treatment should be instituted whenever the disease is detected.

TENNESSEE AND GEORGIA.

The investigations in regard to the prevalence of trachoma in Tennessee and Georgia were made by Acting Asst. Surg. C. A. Bailey, and lasted from December 3, 1913, until April 27, 1914.

Dr. Bailey visited 31 counties in east Tennessee, and examined there a total of 16,950 persons, mostly school children in the rural sections. Among them 341 cases of trachoma were found, or an infection of 2.01 per cent. A similar survey was made by him of 25 counties in northern Georgia; 7,855 persons were examined there, and 7 cases of trachoma found, or an infection of 0.08 per cent. It will be seen that the percentage of infection in Tennessee exceeds that of any of the other States inspected, with the exception of Kentucky; while that of Georgia was comparatively low, only a few cases being found in 3 contiguous counties, adjoining South Carolina. The disease was widely prevalent in east Tennessee, especially bordering on and directly south of Kentucky.

The type of trachoma found in Tennessee and Georgia was, on the whole, not so severe as that reported by Surg. McMullen in his Kentucky survey. In two counties, however, Claiborne and Cocke, many advanced cases were seen, with destructive sequelæ.

During the survey 785 negroes were examined at 11 different points, and only 3 cases were seen at New Tazewell, Tenn., the most heavily infected town of east Tennessee, where 22.46 per cent of trachoma was found among the white population. This confirms previous observations that the negro is not immune to trachoma, but his race is far less susceptible than the white.

In order to create a popular interest in the disease and its prevention, 95 addresses were delivered by Dr. Bailey to more than 9,000 children and adults.

Measures Necessary Against Trachoma.

The recommendations of the above-mentioned officers for the prevention and eradication of trachoma in the territory visited comprise the enforcement of the following measures: Systematic examinations of school children; exclusion from school of all children suffering from active trachoma; employment of school nurses wherever practicable; a campaign of education in the infected territory; maintenance of free trachoma hospitals at suitable points; securing the cooperation of mining companies in the work; and improving the sanitary condition of rural schools.

Dr. Clark's report has been published as Reprint No. 198, Dr. Foster's as Reprint No. 207, and Dr. Bailey's as Reprint No. 220, from the Public Health Reports.

Trachoma in Porto Rico.

At the request of the Governor of Porto Rico, Surg. W. W. King has continued the investigation of the prevalence of trachoma, particularly among school children. As far as opportunity and other circumstances permitted, school children at various places were examined with the intent of obtaining general information as to the spread of the disease and a general percentage representative of the whole island. Both city and rural schools at points on the coast lowlands and in the mountains were visited. About 4,200 school children were examined, of whom 9.8+ per cent presented definite trachoma and 5.4+ per cent presented suspicious symptoms, such as acute conjunctivitis, slight roughening of the conjunctivæ, very slight, indefinite granulation, or border-line cases that would require treatment to differentiate them. It is believed, however, that a majority of these suspicious cases are early and mild trachoma.

A special report upon these examinations is in course of preparation.

TRACHOMA WORK IN KENTUCKY.

Reference was made in the annual report for 1912 (p. 27) to the investigations conducted by Surg. John McMullen to determine the prevalence of trachoma in the eastern or mountainous section of Kentucky. The report of this investigation has been published as Reprint No. 101 from the Public Health Reports.

The investigation having disclosed the fact that trachoma was present and increasing to a marked extent in eastern Kentucky, a request was received from the Kentucky State Board of Health that the service should undertake the control of the situation. An act of Congress approved June 23, 1913, having authorized the use of the "epidemic fund" for trachoma work, immediate steps were taken to begin a campaign against the disease in the infected regions of Kentucky. Therefore Surg. McMullen, in July, 1913, was ordered back to Kentucky, a central office being established by him at Lexington, Ky.

While the primary object was the prevention of the spread of the disease in interstate traffic, the opportunity has been used to give a demonstration of methods of prevention and cure and education of the public in regard to a disease whose widespread dissemination and unusual severity constitute it a public-health problem of national importance. The work done under Surg. McMullen's direction may be considered under two headings—1, eradication; 2, prevention.

Eradication.—In view of the fact that trachoma is essentially a surgical disease, it was found necessary to establish hospitals for the treatment of the patients. Three hospitals have accordingly been established, as follows: One at Hindman, Knott County, September 4, 1913; one at Hyden, Leslie County, September 24, 1913; and one at Jackson, Breathitt County, Mar. 24, 1914. Such available houses in these places as could be found were used for this purpose. These were thoroughly cleaned and put in a sanitary condition to serve the double purpose of a trachoma hospital and as a demonstration to the people of how their own homes could and should be kept. Sanitary water-closets (septic tanks) have been installed at one of these hospitals and it is hoped to have the other two so equipped in a short time. These are also for the dual purpose of hospital use and demonstration.

Each hospital accommodates at least 15 patients besides the outpatient department. The hospitals at Hindman and Hyden are situated in the mountains, about 20 miles from the railroad, and consist of male and female wards, reception room and dispensary, operation room, and nurses' living room. Such cases as require it are kept in the hospital and meals furnished them. This is rendered necessary because many of them would not otherwise be able to receive the necessary care and treatment. By reason of the lack of room in these hospital buildings at Hindman and Hyden the patients' meals are furnished them under annual contract. The Jackson hospital, the only one on the railroad line, is the largest of the three, and the patients are furnished their meals from the hospital kitchen. Each hospital has a resident physician who is an eye specialist, two graduate nurses, and such other help as is necessary. The head nurse has headquarters at Jackson, but visits the other hospitals at intervals.

Two of the leading ophthalmologists of the country visited these hospitals on the invitation of Surg. McMullen and, besides giving the people the benefit of their skill and experience, their visits proved otherwise valuable.

Up to June 30, 1914, the Hindman hospital had been in operation 300 days, the Hyden hospital 280 days, and the Jackson hospital 99 days. During that time 510 persons had been furnished hospital and 1,448 dispensary relief, making a total of 1,958 hospital and dispensary patients, coming in varying proportions from 22 counties in the mountainous southeastern section of Kentucky. The hospital patients were under treatment a total of 4,509 days, the total number of operations performed was 586, and the total number of treatments furnished at both hospitals and dispensaries was 7,864.

The counties from which patients were drawn and the cases treated at each hospital are shown in the following table:

TABLE I.—*Counties from which cases were drawn.*

County.	Hindman.	Hyden.	Jackson.	Total.	Per cent.
Breathitt	5		485	490	25.02
Clark			3	3	.15
Clay		23		23	1.18
Estill			1	1	.05
Fayette			5	5	.26
Floyd	45			45	2.3
Harlan	1	10		11	.56
Jackson		8		8	.41
Knott	487	1	1	489	24.98
Laurel		8		8	.41
Lee	1		14	15	.77
Leslie		543		543	27.73
Letcher	33		3	36	1.84
Madison	1		1	2	.1
Magoffin	4		29	33	1.68
Morgan			17	17	.87
Owsley			4	4	.2
Perry	77	58	25	160	8.17
Pike	24		1	25	1.27
Powell			1	1	.05
Pulaski	1			1	.05
Wolfe			38	38	1.94
Total	679	651	628	1,958	100

The area of the above counties is over 100 miles square. It is evident, therefore, that the influence of the hospitals has extended over a wide area, notwithstanding the fact that the population is widely scattered and the only practicable means of travel being on foot or horseback. One man who was entirely blind was led on foot by a relative a distance of over 50 miles. After an operation and several days' treatment in hospital this man's vision was partially restored. Other cases frequently walk from 10 to 25 miles, and the relief and degree of restoration of vision obtained by many of them is remarkable.

The following table shows the number of trachoma cases and sequelæ treated at each hospital:

Table II.—*Trachoma cases and sequelæ.*[1]

	Hindman.	Hyden.	Jackson.	Total.
Number cases of—				
Trachoma	493	208	265	966
Impaired vision from trachoma	200	147	157	504
Blind	19	17	13	49
Corneal opacity	70	39	128	237
Corneal ulcer	27	23	12	62
Pannus	120	56	95	271
Photophobia	80	58	48	186
Entropion	48	28	58	134
Trichiasis	29	17	58	104

[1] Some of the cases of trachoma presented more than one sequel.

The following table shows the total eye diseases encountered, total operations, etc.:

Table III.—*Hospital treatment, operations, etc.*

	Hindman.	Hyden.	Jackson.	Total.	Per cent.
Number of days hospital was open	300	280	99	....	....
Total daily attendance	2,862	2,142	1,683	6,687	....
Average daily attendance	9	8	20	37	....
Total number new cases	679	651	628	1,958	100.00
Total number trachoma cases	493	208	265	966	49.33
Conjunctivitis	120	299	169	588	30
Cataracts	8	10	15	33	1.68
Pterygerium	6	8	14	28	1.43
Glaucoma	4	3	2	9	.46
Other diseases and conditions	48	123	163	334	17.1
Operations, general anesthetic	96	20	20	136	....
Operations, local anesthetic	157	145	148	450	....
Total	253	165	168	586	....
Grattage operations	159	105	96	360	....
Entropion operations	42	18	31	91	....
Other eye diseases and conditions	52	42	41	135	....

Prevention.—This is practically synonymous with education in regard to the importance of sanitation, clean homes, fresh air, and dietetics. The educational side of the work has been carried on by Surg. McMullen and his associates by means of demonstrations at the hospitals, lectures in the schools and other public buildings, distribution of literature through the mail, at the dispensaries, etc. A nurse has followed up some of the patients to their homes with a view to instructing them as to the care and preservation of the eyes, the prevention of the spread of trachoma, and general hygienic precautions.

More than 10,000 copies of a pamphlet on "Trachoma, its nature and prevention," have been distributed to the householders in the counties of the eastern section of the State, telling in simple language how the disease is spread, how to avoid contracting it, and what to do in case it has already been contracted. The majority of this literature was addressed to the householders personally and sent through the mail. At the dispensaries, patients have also been given the necessary instructions verbally. In the hospitals they have been shown by precept and example how to care for their eyes and what hygienic precautions should be observed. In furtherance of this campaign of education, 81 lectures have been given to audiences including approximately 6,000 people. Where possible the lectures were accompanied by lantern slides, showing conditions existing in the mountains.

More hospitals should be established.—For the eradication and prevention of such a widespread infection of a chronic communicable disease such as trachoma, the establishment of small public health and ophthalmic hospitals has proved to be the best method. Hospitals of this character can easily be extended over as large an area as may be required, and their administration is economical; the average cost per day for the operation of the three hospitals has been less than $52.

As previously stated, such houses as were available were utilized. These were ordinary dwellings then out of repair and in bad sanitary condition. They were selected partly to show what could be done with buildings of this character and to demonstrate the minimum of cost at which similar hospitals could be established and operated by States and counties in other mountain sections.

It was thought inadvisable to establish for the purpose in question hospitals expensive in equipment or operation, and the experience gained shows that like hospital units can be maintained at other mountain county seats for approximately $25 per day, including all salaries, subsistence of patients, rent of building, fuel, lights, and water, and hospital supplies.

The demonstration with the three existing hospitals shows that the campaign against trachoma can certainly be carried to a successful termination. In the interest of public health these hospitals should be continued and others established to form a chain or system in order to reach all of the mountain counties where the infection is found. This will bring relief to the hundreds of helpless sufferers from trachoma who would otherwise be for the best portion of their lives a burden to themselves and their friends and finally end their days in darkness for the want of proper care and treatment. Of the thousand cases of trachoma already treated more than one-fifth have been cured, and the remainder have been rendered noncommunicable by treatment. It is impossible to estimate how many other people have been saved from this scourge by thus removing a thousand foci of infection from their midst. The majority of patients treated in these hospitals are without means and would otherwise never have been given relief. Many who have been practically blind for months and years and charges on the county and their friends have been removed from the pauper list and made self-supporting. Children who have been unable to attend school because of trachoma have been relieved and now have sufficient vision to enable them to get an education. A good example of this, though by no means an isolated one, is the case of a little girl 11 years old, who contracted the disease in infancy. So painful was the light that she was unable to see at all, had to be led around, and was known locally as the "blind girl." She was operated on in one of the trachoma hospitals and given treatment for some weeks, with the result that she has been completely relieved of trachoma, her eyes have been saved, and she will now be able to attend school for the first time when the session begins. The father of this little girl is very poor, and but for the proximity of the Government hospital with its free treatment she would have continued as a focus of infection and ended her days in hopeless blindness. Examples like the above could be multiplied.

The eastern or mountain section of Kentucky includes one-third of the State, 35 counties, with a population (census 1910) of 561,881. Of this number there are only 2,000 foreigners and 13,000 negroes. This section is being rapidly developed, however, and railroads are being built farther into the mountains. The trachomatous native, therefore, is finding his way to the commercial centers, and the newcomers to this part of "Appalachian America" afford fresh soil for the propagation of this disease. An intensive campaign should therefore be waged against trachoma wherever it is found and continued until the work of eradication and prevention is completed.

Migration of Tuberculous Persons.

The possible danger to the public health of the interstate migration of tuberculous persons has often attracted the attention of the bureau. The necessary funds for an investigation of this subject being available, a number of officers were assigned to this work in October, 1913. These studies have been completed in California, New Mexico, North and South Carolina, and Texas, and are now going on in Arizona and Colorado, where they were begun in April, 1914.

The purposes of these surveys as outlined to the officers in charge of the work were to determine as accurately as possible: 1, the extent and direction of the migration; 2, the effect of the travel on the patients themselves; 3, relation to health of fellow travelers and railroad employees; 4, living conditions of tuberculous persons in their new residences; 5, bearing on the sanitary, social, and economic status of the communities resorted to by tuberculous persons.

SOUTHERN CALIFORNIA.

Surg. P. M. Carrington was instructed on October 30, 1913, to make these studies in southern California as outlined above, which were continued until June 30, 1914. During the progress of the work observations were made by him on interstate trains and at all terminal stations visited. Information was solicited from travelers, employees of common carriers, health officials, physicians, and citizens in the localities visited. Every tuberculosis sanatorium in southern California, with the exception of two, was visited, and the views of practically all physicians in that region obtained.

Arrangements were also made with a number of institutions and physicians to collect pertinent data from patients under treatment, and, with the cooperation of Dr. G. G. Moseley, of Redlands, a survey of that town was made to secure desired data that could be used in computing probable averages for the entire region under consideration.

Altogether data were obtained concerning 2,220 cases. These data related to length of residence in California, condition of health on arrival, effect of journey on health, environment since arrival, financial condition, etc.

So far as the studies in question were concerned, the problem of the migration of the tuberculous to California may be said to be confined to the counties of Los Angeles, San Bernardino, Riverside, San Diego, Imperial, Ventura, Santa Barbara, and Orange.

In the geographic division of southern California 17.8 per cent of deaths from tuberculosis occurred within one year after arrival in the State. This would seem to indicate that many tuberculous persons leave their homes for health resorts under condition that are clearly contraindicated. In Los Angeles County the percentage was 16.9 per cent, and in the other counties of the division mentioned 19.9 per cent. Subtracting 17.8 per cent, or 424 cases, from 2,382, the total number of tuberculous deaths for southern California, there remains 1,958 deaths among individuals of more than one year's residence. This figure multiplied by 10 gives 19,580 cases as the probable number in southern California, and, judging by the estimates of county officers and others, this is a very conservative estimate.

The facts brought out in Dr. Carrington's investigation tended to show that the migration of tuberculous persons into southern California, while still large, amounting probably to from 2,000 to 4,000 annually, is decreasing, such decrease being due probably to the teaching of recent years, the establishment of sanatoria throughout the East, the successful treatment of tuberculosis in the home environment, and the less widely held belief in the climatic treatment of tuberculosis.

Little or no evidence was obtainable to show that the migration of tuberculous persons has any decided bearing on the health of other travelers and employees of common carriers.

The conditions under which tuberculous persons live in the localities resorted to for change of climate and the effects of these conditions on the progress of their disease depend very largely on the question of finances, influenced by education and previous habits, and whether or not the patient has had or continues to have competent medical advice. It was found that early cases, well advised and financially independent, frequently recover.

In regard to southern California, it was found that the presence of tuberculous persons, who have migrated to this section, has as a rule had a beneficial effect on the health and social and economic status of the various communities. Many communities in southern California have been built by migrating consumptives, and important enterprises originated by them.

The only communities in which the public health has suffered are those to which large numbers of far-advanced and hopeless cases resort without means to supply their necessities. It is the indigent consumptive who is the most dangerous, because he is as a rule not so well instructed, more careless in his personal habits, and necessarily resides in the cheap rooming and boarding houses.

From the studies regarding forced or assisted migration made by Dr. Carrington, it was found not to be a serious problem in southern California. Those indigent consumptives who are sent to California by public or private charities are so assisted for humanitarian reasons through the agency of well-meaning, though ill-advised, charity.

NORTH AND SOUTH CAROLINA.

The investigation made by Passed Asst. Surg. A. D. Foster in the localities resorted to by the tuberculous in North and South Carolina was along the same lines as the investigations carried on in southern California.

North and South Carolina are much less frequented by the tuberculous in search of health than are Texas, Arizona, New Mexico, and California. Conditions also naturally differ from those found in the latter States.

The localities in North Carolina most resorted to by the tuberculous are Asheville, Hendersonville, Southern Pines, Waynesville, Black Mountain, and to a lesser extent Tryon. Studies were made in these communities as well as at Aiken, which is the principal resort for the tuberculous in South Carolina.

At the request of the secretary of the North Carolina State board of health, Passed Asst. Surg. Foster was detailed to proceed to the State Tuberculosis Sanitarium at Aberdeen, N. C., to confer with the secretary of the State board of health and assist him temporarily in the care and control of tuberculosis in that institution.

At the request of the secretary, Dr. Foster assumed charge of the sanitarium for a period of several weeks, and during that time opportunity was had to carry on studies bearing upon the question of the migration of tuberculous persons.

The extent and direction of the migration was studied, and information obtained from practicing physicians, patients, records of several sanatoria, in some localities from death certificates on file in the office of the registrar of vital statistics, and in Asheville from the register of tuberculous persons on file in the office of the city board of health.

It was found that several localities in North Carolina which were formerly much frequented by the tuberculous are now frequented to a lesser extent. This decrease in the migration to these localities appears to be due to the fact that the latter are becoming more and more frequented by healthy tourists, who are more desired by the townspeople than the sick. Also accommodations for the tuberculous are no longer available. Owing to objections on the part of tourists, it is not practicable to house the health seeker in the same hotel or boarding house with the tourist.

The subject of railroad sanitation and the measures taken by common carriers for the protection of the health of other passengers and employees was also studied. Asheville being the terminus of several railroad divisions, and also an important health resort, opportunity was had while in that city to study the methods of disinfection of sleeping cars and railroad coaches. Some time was spent in the railroad yards observing the method of cleaning and disinfecting cars, which appeared to be carried out in a thorough and efficient manner.

In regard to the bearing of the migration of tuberculous persons on the health of other travelers and on the employees of common carriers, it may be stated that no evidence was obtained of any case in which the disease was contracted in this manner.

It was found that the conditions under which the tuberculous persons live in the resorts to which they have migrated vary somewhat in different localities and is naturally dependent upon the financial status of the patient.

The resort towns of North Carolina do not have the so-called slum districts so frequently found in other cities; therefore we do not find tuberculous migrants crowded together in congested districts. Those of limited means are housed in boarding houses which are less pretentious than those inhabited by the better classes, and their food is plainer and of a more limited variety. Those of little means are able to secure medical advice equal to that obtainable by others in better circumstances owing to the open-heartedness of the physicians practicing in the resort towns.

With the exception of Asheville, there is no indigent problem in the resort towns of this section, and the question of forced migration is one with which the communities are not troubled. No case of forced migration in its true sense was met with in the course of the investigation.

TEXAS AND NEW MEXICO.

Passed Asst. Surg. E. A. Sweet conducted the investigations in Texas and New Mexico. The data secured by him seemed to indicate that the number of health seekers, contrary to the general belief, was increasing, and that the tuberculous population of the resort cities in those States, as indicated by death rates and estimates based upon such, was without exception advancing. However, the percentage of hopeless or far-advanced cases traveling to and from that section appeared to be decreasing.

The length of residence previous to death was determined for several years to gain some insight as to the stage of the disease at the time the travel was performed, and in some resorts it was found that over 15 per cent of all deaths occurred within 30 days after arrival and over 50 per cent within six months of arrival.

The sanitation of interstate railway coaches was also investigated, with the idea of determining what precautionary measures were in force and whether or not it was advisable to institute more stringent regulations for the protection of the public.

Special studies were made of the status of invalids subsequent to their migration to ascertain what hospital or other accommodations were open for their reception, what difficulties were encountered, and the conditions under which they lived. The consumptive indigent problem was gone into at length for the purpose of showing exactly how much of a burden these people had become, to place the responsibility therefor, and to indicate measures for relief.

The influence of the migration of the tuberculous upon the health problem of communities, a most important subject, was likewise considered, and every means adopted to show whether or not such invalids had become a menace to others. The amount of indigenous tuberculosis in the Southwest was determined as closely as possible, and it was discovered that among the white American population the disease is extremely rare, so much so that we can almost say an immunity is present, while the Mexican population is being decimated by it. It then became necessary to establish the relationship between the coming of invalids and this latter fact, and it was possible to show with a fair degree of certainty that there is not the slightest connection between the two incidents.

Dr. Sweet's complete report will be published as a separate publication, as will also the reports of Surg. Carrington and Passed Asst. Surg. Foster.

LABORATORY STUDIES ON TUBERCULOSIS.

Friedmann treatment.—The investigation of the claims of Dr. Frederic Franz Friedmann for the cure of tuberculosis was continued at the Hygienic Laboratory. These studies were practically completed at the close of the fiscal year, and the results of the investigations are being tabulated and prepared for publication. It is quite evident that the claims made by Dr. Friedmann for his vaccine were not founded upon a satisfactory basis. This is seen not only from the studies made at the Hygienic Laboratory, but also from reports made in various other places. These reports have been almost uniformly adverse to Dr. Friedmann's claims. A preliminary report of these studies was published in the Public Health Reports, May 16, 1913, and the full report in Hygienic Laboratory Bulletin No. 99.

Von Ruck treatment.—Studies of the methods and practices of Drs. Karl and Sylvio von Ruck for immunization against and treatment of tuberculosis have been continued at the Hygienic Laboratory. It is believed that these studies will be completed some time during the coming fiscal year, so that a report may be made in accordance with the resolution of the United States Senate requesting the investigation.

Other studies.—In the course of the studies noted above, opportunity was taken to begin a study of various problems relating to the general subject of tuberculosis. Among these has been the examination of sera from tuberculous and normal individuals. Studies have been made on the serological reactions of tuberculosis with a view of determining their significance not only from a diagnostic and prognostic standpoint, but as regards the pathology of the disease and immunity thereto.

Complement fixation.—Among these reactions, that of complement fixation has been most studied. The literature on the subject has been thoroughly examined, many experiments bearing on the general principles involved have been performed, and tests on over 100 sera made. The subject is a complicated one and the studies are as yet incomplete, but results concordant with the most recent and best work are being obtained.

The stimulus which has induced most of the investigators to enter this field has undoubtedly been the hope of being able to devise a test which will be of value in the diagnosis of early and obscure cases of tuberculosis, in prognosis, or the control of specific therapy. While some claim is made that certain of these results have already been achieved, this opinion has not received general confirmation. It is safe to say that, whether or not these hopes of immediate practical application are realized, studies of this character are certain to be of scientific value and to throw light on the serum pathology of tuberculosis. These latter studies have been made by Passed Asst. Surg. A. M. Stimson.

STUDIES ON TUBERCULOSIS AT FORT STANTON, N. MEX.

Blood pressure.—On September 13, 1912, the Surgeon General directed that blood pressure readings should be made at the various marine hospitals, all of which are at or near sea level, on patients about to be transferred to the sanatorium at Fort Stanton, N. Mex. Careful records have been kept at the sanatorium of the same patients, and the effects of the altitude, 6,230 feet, upon blood pressure studied. Of 172 patients observed, 125, or 72.67 per cent, had approximately the same systolic blood pressure at sea level and at 6,230 feet. In this number are included those readings which were not more than 10 mm. of Hg. higher or lower than the sea-level reading. Twenty-one showed readings from 11 to 20 mm. of Hg. higher, and nine showed readings from 11 to 20 mm. of Hg. lower at this altitude. Nine were 21 to 30 higher, and four 21 to 30 lower. One was over 30 higher, and three over 30 lower. It is thus evident that the effect of moderate altitude on the blood pressure of tuberculous patients is not marked. The blood pressures of patients subject to hemorrhage at the sanatorium have been compared with those of patients free from hemorrhage while there. No appreciable differences were observed in either the systolic or diastolic pressures except in a few instances where complications were present. The results of the study will be published shortly.

Induced pneumothorax.—Investigation was begun in December at the Fort Stanton sanatorium of the treatment of selected cases of pulmonary tuberculosis by induced pneumothorax as practiced by Forlanini, Murphy, Brauer, and others by whom the treatment has been employed for several years. This consists in the introduction of some inert gas, usually nitrogen, into the pleural sac on one side to compress the diseased lung, which is thus kept at rest by repeated fillings for a prolonged period—one to four years. An expert in the method was engaged and spent three months at the sanatorium, selecting cases and instructing the officers in the technique of operation. Of 231 tuberculosis individuals present 36 were found suitable for treatment by the method, but pleural adhesions were encountered preventing treatment in 16 of these. It was found that the treatment is applicable to about 13 per cent of patients found in the sanatorium. Of 20 in which pneumothorax was successfully induced 2 have died and treatment has been discontinued in 1. Of the 17 which remain under treatment only 1 has failed to improve; the other 16 show symptomatic improvement, which is slight in 3 of the cases but very marked in the other 13. The results have been very satisfactory and the procedure will be continued, suitable cases being added from time to time. It should be understood that induced pneumothorax is applicable only to a comparatively small number of carefully selected cases, that it is not a "cure," and that it should not be attempted by the novice but only by one who has become proficient in the selection of cases and is familiar with the technique and application of the operation. Reports on the introduction of the method at Fort Stanton and on the results of treatment so far obtained, by Dr. M. F. Sloan and Passed Asst. Surg. F. H. McKeon, respectively, will be published shortly.

Watery extract of tubercle bacilli.—Early in the fiscal year treatment of a series of patients with von Ruck's watery extract of tubercle bacilli was undertaken at Fort Stanton under conditions calculated to assist in determining the merits of this agent. Twenty-five patients were treated for periods varying from 4 to 10 months; during that time 1,677 injections were given and about 600 c. c. of the extract used. Blood serum from all patients so treated and from controls has been furnished to the Hygienic Laboratory to further investigations being conducted at that institution.

Vaccine of dead avirulent tubercle bacilli.—Seventeen patients were treated at Fort Stanton with a vaccine of dead avirulent tubercle bacilli. The injections were given once a week during a period of 10 months, the dosage being that used by the exploiters of the vaccine, and the patients carefully observed throughout. The results have not been encouraging, and the treatment will be discontinued.

The coagulation time of blood.—Deaths from pulmonary hemorrhage are rather frequent at the Fort Stanton Sanatorium, 82 deaths out of a total of 790 having been so caused. Effort was made to find a practical method of determining the coagulation time of blood so that the presence of any dyscrasia among those prone to hemorrhage might be discovered and the effect of drugs observed. All the methods commonly employed were compared and some original methods tried. No entirely satisfactory method of determining the coagulation time has been found and the purpose for which the investigation was begun has not been accomplished. The work performed, however, involving a large number of tests, will be published as a commentary on the subject.

Morphology of the tubercle bacillus.—Microscopical studies of the morphology of the tubercle bacilli found during the routine examination of sputa from 323 individuals were made at Fort Stanton. Opportunity was found to compare results of completed treatment among 154 of these, the slides having been prepared four years ago. Nothing of significance nor anything useful in prognosis was found.

Occupational Diseases and Industrial Hygiene.

The hygiene of workers, especially in regard to occupational diseases and the effect of industries upon health, constitutes an important phase of sanitary work. During the year considerable attention has been paid by the service to this subject. Plans have also been made for continuing and extending the work during the ensuing year. The following summaries will serve to give an idea of the extent of the activities of the service in this direction.

GARMENT WORKERS IN NEW YORK CITY.

At the request of the joint board of control of the garment trades, New York, N. Y., approved by the city commissioner of health, a general investigation has been undertaken under the direction of Surg. J. W. Schereschewsky as to the health of garment workers in that city and the presence of insanitary conditions in the places where they are employed.

The investigation may be divided into the following parts: 1, inspection of places of employment; 2, physical examination of employees; 3, special studies of lighting and ventilation.

The sanitary inspections of places of employment are being conducted with a view to securing data in regard to sanitary conditions, and especially to determining the occurrence of defective lighting conditions and methods of ventilation, particularly with relation to temperature, humidity, and the effect of the use of gas-heated irons on the air.

The physical examinations of both male and female garment workers will throw light on the incidence of disease among them and the effect of occupation on their physical status. It has been claimed, for instance, that certain kinds of employees in the garment trades compare unfavorably from a physical standpoint with other kinds of employees, and the data obtained will serve to prove or disprove this claim.

For the conduct of these investigations offices were secured in New York City, and Passed Asst. Surgs. F. Simpson and R. Olesen were detailed to assist Surg. Schereschewsky. Three acting assistant surgeons, one chemist, and one physicist were in addition employed to attend to various phases of the work.

Up to June 30, 1914, a total of 1,500 garment workers had been examined, and work had been begun on the studies of illumination and ventilation of shops.

TUBERCULOSIS IN RELATION TO INDUSTRIES.

In accordance with requests received from the Anti-Tuberculosis League of Cincinnati, Ohio, and the State and city health authorities, Surg. D. E. Robinson was directed to conduct an investigation of the prevalence of tuberculosis in that city as related to certain industries. The investigation was begun on March 4, 1914, and was still in progress at the end of the fiscal year. The local health authorities and the Anti-Tuberculosis League have given valuable cooperation in the work, the latter association having furnished an office for this purpose.

Two local physicians, Drs. H. Freudenberger and W. J. Topmoeller, have been employed to assist Surg. Robinson. One of the chief features of the investigation has been a systematic examination of the persons employed in various industries.

In the first place, the consent of the employer to the examination of his employees is obtained. In the majority of instances, the employers, when told of the object of the examination and benefits to be derived, have readily given their consent; but some, because of the loss of time involved, or perhaps, from knowledge of bad sanitary conditions existing in the factory or shop, have refused. The next step is to secure the consent of the employees, and in order to do this, the physicians usually enter the factory at the noon hour of the day agreed upon with the employer, and after lunch the employees are assembled in a convenient place and a short talk is given, describing the benefit of such an examination. The talk is usually made by the factory lecturer in the employ of the Anti-Tuberculosis League.

After completion of the talk the physical examination is begun. This is conducted in some place in the factory as private and as far removed from the noise of the machinery as can be found. When making examination of female employees, a trained nurse in the employ of the Anti-Tuberculosis League is always in attendance. A primary examination is first made of those who will consent, and the names are taken of those in whom suspicious symptoms or physical signs of tuberculosis are found. These are called back for a more thorough examination, and for the purpose of obtaining all the statistical data possible.

In many cases this examination is not sufficient to establish a positive diagnosis, and the employee is invited to visit the office of the service on Saturday afternoons (the only time that it is possible for him to do so) until it can be determined positively whether or not a tubercular infection is present. He is also requested to bring with him a specimen of the sputum for bacteriological examination by the board of health.

While the majority of the employees consent to the examination, many refuse, and too often those refusing are the ones who are suspicious of their physical condition, and either do not want to know the truth or fear to lose their positions if it is found that they are suffering from tuberculosis. Still others refuse because they feel the examination to be an infringement on personal liberty. In case an employee is found to be tuberculous and has a family physician, he is advised to report to him for examination and treatment. If he has no family physician he is advised to call upon the Anti-Tuberculosis League, which looks after the welfare of the patient and also of his family. It happens, at times, that a person is found working in a factory who is a menace to his fellow workers through his careless habits, especially that of promiscuous spitting; all these are reported to the board of health for such action as it sees fit.

Many are found whose health is below the standard for the occupation. An attempt is made to keep these employees under observation until tubercular infection can be eliminated as the cause for the lowered vitality.

The results of the examination of the factory employees to June 30, 1914, are shown in the following table:

Industry.	Number examined.			Showing evidence of tuberculosis, active or inactive.		
	Male.	Female.	Total.	Male.	Female.	Total.
Machine and foundry products	1,178	8	1,186	9	0	9
Bakers	23	2	25	1	0	1
Printers and binders	250	157	407	0	1	1
Hats and caps	20	65	85	0	1	1
Paper boxes	8	36	44	0	0	0
Garment workers	505	547	1,052	5	7	12
Asbestos products	289	26	315	1	0	1
Carriages	106	11	117	0	0	0
Advertising novelties	45	20	65	0	0	0
Soap	207	85	292	1	3	4
Paints and oils	56	2	58	0	0	0
Tobacco (chewing)	11	35	46	0	0	0
Lenses	16	0	16	0	0	0
Furniture manufacturers	125	0	125	2	0	2
Manufacturing jewelers	62	7	69	1	0	1
Silversmiths	2	0	2	0	0	0
White lead	168	0	168	0	0	0
Feather goods	21	27	48	0	0	0
Gold pens	22	7	29	0	0	0
Waste	143	26	169	1	0	1
Ink	174	10	184	0	0	0
Shoes	469	329	798	10	1	11
Engineering appliances (brass and iron)	809	34	843	8	0	8
Total	4,709	1,434	6,143	39	13	52

Up to June 30, 1914, the number of establishments visited was 48.

SANITARY SURVEY OF INDIANA INDUSTRIES EMPLOYING WOMAN LABOR.

At the request of the commission appointed by the Legislature of the State of Indiana to investigate the conditions surrounding the employment of women, Surg. M. J. White was detailed to secure the sanitary data required for its work. His survey began March 19, and continued until April 25, 1914.

Dr. White had been instructed by the bureau to make the sanitary survey of such places of employment as might be designated by the commission. The list prepared by the latter included 96 establishments (laundries, textile mills, tile factories, enamel factories, electrical supplies, metal trades, asbestos and mica factories, candy factories, cigar factories, garment trades, department stores, drug and instrument factories, cracker factories, box factories, soap factories, glass factories, rubber factories, book and catalogue factories, potteries, buggy factories, canneries, and bag factories) located in 13 different cities, namely, Indianapolis, Richmond, Muncie, Elwood, Jonesboro, Fort Wayne, South Bend, Chesterton, Valparaiso, Hammond, Terre Haute, Evansville, and Cannelton.

In his survey, Dr. White obtained data in regard to the following points: Location and construction of establishment; air space for each employee; provisions for ventilation, illumination, and regulation of humidity and temperature; drinking, toilet, and washing facilities; cloak, lunch, and rest rooms; use of power machinery, including speed, safeguards, foot treadles, and pressure necessary to operate it; fire exits, extinguishing apparatus, and drills; physical status of employees in so far as could be determined during the sanitary inspection of the places of employment; and, finally, any other conditions having a direct or indirect influence on the hygiene of the industries.

Dr. White's observations indicated the need for certain sanitary improvements in regard to ventilation, lighting, heating, and humidity; removal of dust and fumes; fire-escape facilities; overwork; working dress; protection against accidents; industrial noise; recreation, rest, and exercise; cloak, lunch, and rest rooms; washing, drinking, and toilet facilities; and water supply. On each of these subjects specific recommendations were submitted to the commission, coupled with reference to existing law and its enforcement and deficiencies.

In Dr. White's report, copy of which was furnished to the commission, and subsequently published as supplement No. 17 to the Public Health Reports, special mention was made of each of the establishments visited and of the conditions observed.

TRACHOMA AMONG STEEL-MILL WORKERS.

An unusual occurrence of trachoma among the employees of the Youngstown Sheet & Tube Co., a corporation operating extensive steel works in East Youngstown, Ohio, and the alarm of the people on that account having been reported to the Secretary of the Ohio State Board of Health, a request was received from that official for the detail of an officer to investigate the prevalence and origin of the disease.

Surg. J. W. Schereschewsky was assigned to this duty, on which he was engaged from January 7 to January 24, 1914. His investigation consisted in an examination of the eyes of as many as practicable of the factory personnel, in order to establish the rate of trachoma prevalence, and an inspection of the sanitary conditions of East Youngstown, in order to see to what extent the disease was prevalent in the community, outside of the mills, as well as to note the general sanitary conditions and the opportunities for the spread of trachoma in schools and lodging houses.

Five thousand nine hundred and sixty-two employees of the company were examined, among whom 76 cases of trachoma were found, or a rate of prevalence of 1.3 per cent. In addition 19 cases of suspicious eye disease were observed. Eighty per cent of these cases were found in the representative of three races, Roumanians, Croatians, and Magyars, who form only about 28 per cent of the total number of persons examined. The incidence was about the same in persons of the above races—that is, 3 per cent, followed in order by Lithuanians with 2 per cent, Italians with 0.9 per cent, Slovaks with 0.7 per cent, Poles with 0.4 per cent, and finally, Americans with 0.23 per cent.

It seemed probable that, with but few exceptions, the disease had been contracted subsequent to the landing of these foreigners in the United States, and in the great majority of instances, in view of the duration of the infection, during the time of employment with the steel mills company. On the whole, the impression was gained that the conditions favoring the spread of trachoma did not prevail in the steel plant to the same extent as in the workers' homes and lodging houses. Attention was therefore directed to the sanitary conditions in East Youngstown and their relation to the dissemination of the disease.

The town was found to be lacking completely the fundamentals of sanitation, namely, a public water supply, sewerage, a system of garbage disposal, street grading, public hospitals and dispensaries, medical inspection of school children, and a proper health organization. The lodging houses occupied by the factory employees were extremely overcrowded and very insanitary, their condition amply accounting for the spread of trachoma among the occupants.

Examination of schools.—It was thought that an examination of the school children would give a fair idea of the extent to which trachoma was present among the unemployed population. Through the courtesy of the school superintendent, all the pupils in the public schools (652 in number) were examined, together with the teachers, and 10 cases of trachoma were found, or a rate of prevalence of 1.53 per cent. The greatest number of cases existed at the school situated in the district having the greatest number of lodging houses.

It was realized that any effective treatment of the situation at East Youngstown should include, in addition to specific measures at the mills for the prompt detection, treatment, and supervision of cases of trachoma, the betterment of the many insanitary conditions in the town. Dr. Schereschewsky included, therefore, these two points in a series of recommendations made to the company.

A complete report of this investigation was published in the Public Health Reports of March 6, 1914.

COOPERATION WITH INDUSTRIAL RELATIONS COMMISSION.

At the request of the United States Commission on Industrial Relations, Surg. B. S. Warren of the service was detailed to act with the commission as medical adviser. The object of the commission is to discover the underlying causes of labor unrest and report their findings to Congress with recommendations as to remedies necessary to remove these causes of unrest.

A careful study is being made of reports on existing housing, living, and working conditions in the principal industries of the United States as related to labor unrest. It is expected that this study will be supplemented by sanitary surveys in a few typical industrial centers in this country.

Surg. Warren has already prepared an outline of the requirements which must be worked out to fix hygienic standards for the industries, and show their relation to the employer, employee, and public-health authorities. This outline has been published as Reprint No. 195 to the Public Health Reports.

In addition, Dr. Warren is also making a study of sickness insurance and its relation to the prevention and cure of diseases among industrial workers.

MINE-SANITATION STUDIES.

In cooperation with the United States Bureau of Mines, Department of the Interior, arrangements were made toward the end of the fiscal year for the conduct of investigations in regard to the sanitation of mines and the mine industry.

Passed Asst. Surg. A. J. Lanza, who had been previously directed to undertake an investigation of problems connected with the migration of tuberculous persons to Arizona and Colorado, was occordingly instructed to inspect metal mines in the Rocky Mountain region and to make at the same time the necessary examinations to determine the prevalence of miners' asthma and other diseases among miners.

These investigations of mine sanitation have been conducted with some intermissions from April 24 to June 30, 1914, and will be prosecuted during the next fiscal year. Up to June 30 Dr. Lanza had inspected the mines located in the neighborhood of Butte, Mont.; Cripple Creek, Colo.; and Clifton, Globe, Miami, Ray, and Jerome, Ariz. A preliminary report has already been prepared by him on the Butte, Mont., mines; and similar reports will be forthcoming on the Colorado and Arizona mines.

Three out of thirty metal mines in operation in the neighborhood of Butte were inspected, the operating company furnishing every opportunity to study existing conditions. It was found by Dr. Lanza that sanitary conditions in the mines observed were good in so far as they depended on factors under the control of the operators. Certain kinds of work were performed under unhygienic conditions for which no satisfactory remedy has so far been devised, as, for instance, work in the presence of moist heat or in an atmosphere laden with hard-rock dust.

A menace to health was present in the promiscuous spitting, especially in dry and dusty levels. The exposure to cold air on leaving work must be deemed responsible for many of the pneumonia cases occurring among the miners. A special effort was made to acquire information in regard to miners' asthma. The local physicians treating miners agreed that it was uncommon in the Butte mines. Its actual occurrence could be determined only by an extensive physical examination of the miners. The fact that the Butte mines are not as dusty as mines in other regions may have something to do with its reported rarity.

METALLURGICAL PLANT INVESTIGATIONS.

In cooperation with the United States Bureau of Mines, Department of the Interior, a plan was formulated for the investigation of health conditions in blast-furnace plants and steel mills in the Pittsburgh, Pa., district. Asst. Surg. J. A. Watkins was assigned to this work, which was begun April 17 and was still in progress at the end of the fiscal year.

The data collected in this investigation by Dr. Watkins are rather comprehensive; and at the end of the fiscal year he had had time to complete the survey of only one plant. The information assembled by him is intended to throw light on the following points in relation to health and disease: Number and nationality of employees; character of their work, working hours, periods of rest, and conditions as to temperature, humidity, presence of gases, dust, etc.; morbidity and mortality statistics; disability and old-age insurance; provisions for sewage and waste disposal; lavatory arrangements; character of water supply, etc.

SUSPECTED TYPHUS FEVER.

Rochester, N. Y.—At the request of the city health officer of Rochester, N. Y., Surg. J. Goldberger was directed on November 7, 1913, to proceed to that city to investigate certain cases of fever, which were suspected of being typhus. After observing the patients in question, a diagnosis of typhoid fever was made by Surg. Goldberger, which was subsequently confirmed by the development of the disease.

Richmond, Va.—At the request of the city health officer of Richmond, Va., Surg. J. Goldberger was directed on June 7, 1914, to proceed to that city to see a case of fever suspected of being typhus. A negative opinion was rendered by Dr. Goldberger.

INVESTIGATIONS OF TYPHOID FEVER.

As in former years, special attention has been paid to typhoid fever studies. The prevalence of this disease in the United States appears to be undergoing a gradual reduction. For the country, as a whole, the rate is probably not more than about one-half what it was 30 years ago. Nevertheless, the United States still has an undeniable prominence in typhoid fever prevalence, the rates in the last few years having been several times as high as the respective rates recorded for some other advanced countries of the world.

Judging from such evidence as is at hand, it seems highly probable that the reduction mentioned has resulted from improved sanitation in urban communities only. Extensions of sewerage systems, improved public water supplies, better safeguarded municipal milk supplies, and other sanitary improvements in urban districts have effected reductions not only in those districts but in surrounding rural sections.

Typhoid fever studies during the year have accordingly related both to urban and rural conditions. Those relating to the former were made on request of State and local health authorities following outbreaks of the disease, and the latter taken up systematically to improve rural sanitation and to encourage efficient local health organization. The studies conducted in country districts are subsequently described under the heading of "Rural sanitation," page 57.

WEST RALEIGH (N. C.) COLLEGE.

Upon request of the North Carolina State board of health and of the president and trustees of the North Carolina College of Agriculture and Mechanical Arts, West Raleigh, N. C., Passed Asst. Surg. J. R. Ridlon was instructed to make an investigation of the unusual prevalence of typhoid fever at the above college. On request of the city authorities, the investigation was subsequently extended to include typhoid conditions in the city of Raleigh, N. C. Its duration was from July 25 to August 15, 1913.

The first case of typhoid fever occurred at the college on May 17. The college closed on May 28, and after that reports of other cases arrived. By correspondence it was ascertained that a total of 11 cases had occurred among the students, with 4 deaths. In some of these cases there was a strong probability, judging from the date of onset, that the infection must have been contracted after the close of the college.

Dr. Ridlon's investigation embraced all possible sources of infection, such as water, milk, ice cream, ice, vegetables, contact, flies, and typhoid carriers. The dairies supplying the college with milk were inspected, and laboratory examinations made of water and excreta.

Owing to the absence of the students and a lapse of two months, the data collected were in some instances not satisfactory. After a thorough investigation of all the possible causes, no source of infection could be found on the college grounds or in the buildings. The one source of infection which was not definitely excluded, especially in the case of six patients with nearly the same date of onset, was a transitory contamination of milk or ice cream.

As a safeguard against similar occurrences in the future, Dr. Ridlon recommended to the college authorities the replacing of sewage below water pipes wherever they intercepted, the making of weekly analyses of the water used, the closing of all springs in the college grounds, antityphoid vaccination for the students, and the screening of all toilet windows.

RALEIGH, N. C.

As stated above, the investigation was subsequently extended to include a number of cases of typhoid fever (31) originating in the city of Raleigh from May 15 to July 31. In order to ascertain the possible causes of the infection Dr. Ridlon visited these cases and made a survey of the city with special reference to the water system, sanitation of food and dairy establishments, and sewage disposal.

While in several of the cases the causes responsible for the infection could not be traced, the factors most prominent in the causation of typhoid in Raleigh appeared to be surface privies facilitating the carriage of the infection by flies; open wells with polluted water; contaminated milk and ice cream; and infection transmitted by direct contact.

Dr. Ridlon recommended to the city authorities the adoption of ordinances to secure the production of a safe milk supply, the extension of the sewerage and water systems, the abolishment of surface privies wherever possible, and the prompt reporting and investigation of all typhoid cases.

CUMBERLAND, MD.

On requests of the city authorities and the State board of health of Maryland, Surg. L. L. Lumsden and Passed Asst. Surg. H. de Valin were directed to conduct an investigation in order to determine the sources and modes of spread of typhoid infection in the city of Cumberland, Md. The investigation lasted from September 16 to October 27, 1913, and was conducted in cooperation with the city health department.

The available records showed that typhoid fever had been highly prevalent in the city for a number of years. During the three previous years 81 deaths from the disease had been reported, making an annual average of 27 deaths, and a typhoid death rate of 123 per 100,000, about five times the typhoid fever death rate for the "registration area" of the United States. From January 1, 1913, to the date when the investigation began, 418 cases and 20 deaths from typhoid fever had been reported, not including cases brought to the city for treatment after the commencement of the disease.

The investigation by Drs. Lumsden and de Valin comprised, 1, visits to the cases reported during the year; 2, inspection of yards, alleys, etc.; 3, inspection of food establishments, dairies, and dairy farms; 4, inspection of wells and cisterns; 5, bacteriological examinations of samples of water; 6, review of the records, maps, etc., in the city health department. Public meetings were held from time to time with a view to ascertaining and stimulating public health sentiment.

The evidence obtained early in the investigation pointed strongly to the water from wells and cisterns as an important source of the infection which was still causing a great prevalence of typhoid fever, and Dr. Lumsden recommended to the city council the prompt adoption of measures for the purification of the public water supply and the prohibition of the use of polluted water. In accordance with his advice, a warning to the public to boil or treat the water used for drinking purposes was issued by the city health department on October 15.

In his report to the city council, Dr. Lumsden reviewed the possible causes of typhoid fever in Cumberland, such as neglect of prophylactic measures at the bedside of patients, insanitary excreta disposal, water pollution, unsafe milk, contaminated food supplies, abundance of flies, inadequate garbage and manure collection, and general insanitary conditions.

As remedies he recommended purification of the public water supply, abolishment of public wells and springs and also of private wells, cisterns, and springs unless repeated examinations proved the water pure; official inspections of milk and other food supplies; adoption of proper standards of milk purity; sanitary collection of stable manure; appointment of a sufficient number of milk, food, and sanitary inspectors; sanitary maintenance of water-closets and privies; extension of public water and sewerage systems to all sections of the city; prompt investigation of all cases of typhoid fever; and organization of an efficient health department with the necessary personnel and adequate funds.

A public health meeting, attended by over 2,000 people, was held at the end of the investigation, at which the recommendations submitted were indorsed unanimously.

ROCKVILLE, MD.

On the request of the State Board of Health of Maryland, Surg. L. L. Lumsden was detailed on February 2, 1914, to make an investigation of an outbreak of typhoid fever in Rockville, Md. He found that 17 cases had been reported by the local physicians to the county health officer and that the period of causation had begun about December 25 and reached its maximum in the first week in January.

Dr. Lumsden's investigation comprised, 1, a general survey of the town and its environs; 2, an epidemiological study of the cases of typhoid fever; 3, bacteriological examinations of the public water supply; and 4, a special sanitary survey of the area around the public wells, from which area surface or underground drainage was considered likely to reach the town water supply.

The seasonal period of occurrence, the explosive character, and the geographical distribution of the outbreak suggested that the infection had been disseminated by water, milk, or some other food supply used by a large proportion of the town's population. Therefore an inquiry was immediately initiated to determine the sources of water and food supplies used during the 30 days prior to onset of illness by the persons then ill.

Rockville has a public water supply obtained from two driven wells, which is piped throughout the town and is used as the sole or principal source of water for drinking and culinary purposes by about 90 per cent of the population. The methods of excreta disposal were obviously crude and dangerous.

On inquiry it was ascertained that in November, 1913, a visitor had come to the residence nearest to the wells (about 400 feet from the pumping station), which is situated on ground sloping gently toward the wells, and had a privy of the open-back, surface variety. The visitor took to bed with typhoid fever about November 20. For the first two or three weeks of illness the disease was not recognized, and the excreta, without any disinfectant treatment, were deposited in the privy. After the case was recognized as typhoid fever the dejecta were said to have been treated with "powdered lime" and buried in the garden. From the data assembled it appeared that if the public wells collected surface or subsoil water from the drainage shed within 600 feet of and to the south of the wells, the town's water supply had been exposed to dangerous contamination.

It was subsequently found that the construction of one of the wells was such as to make exceedingly probable this contamination. The dangerous pollution of the ground in the neighborhood of the wells, the time of occurrence of heavy rains, and the results of the bacteriological examinations of water from the old well, or well No. 1, all supported the epidemiological findings which had pointed definitely to the public water supply as the vector of the infection which had caused the outbreak. At the suggestion and under the direction of Prof. E. B. Phelps, of the Hygienic Laboratory, a test with uranine was tried. On February 11 the mouth of the secret ditch which drained the infected privy was plugged up to simulate the condition obtaining in times of heavy rains and which might obtain at any time in freezing weather. Then 2 pounds of uranine powder were placed in the spring branch at a point a few feet downstream from the privy, and the pumps were started at the usual rate on the two wells. After two hours of pumping the water from well No. 1 presented a distinct greenish color characteristic of uranine. The tint reached its maximum after about 10 hours of pumping. Not a trace showed in the water from well No. 2. The result of this test proved that there was a fairly rapid communication between well No. 1 and the secret ditch draining the privy and ground in which the dejecta from the typhoid-fever patient had been deposited during December, 1913, and January, 1914.

In his preliminary recommendations to the town authorities, Dr. Lumsden urged 1, official advice to the public to boil all water until assured that the public supply was safe; 2, the treatment of the public water supply with hypochlorite of lime; 3, the appointment of a visiting nurse to visit all homes at which there were recognized or suspected cases of typhoid fever to demonstrate and assist in the carrying out of proper bedside prophylaxis; and 4, a radical improvement, as soon as practicable, in the general sanitary conditions of the town, particularly in respect to the collection and disposal of human excreta.

These recommendations were promptly approved by the city council, and their effect was soon apparent in the subsidence of the disease. The installation of a complete water-carriage sewerage system was strongly advised at every opportunity presented in the course of the investigation. The advisability of having it installed has been agreed to by a large proportion of the citizens, and the town council has sent to the State legislature a bill authorizing the corporation to issue the necessary bonds for this purpose.

With the sanitary improvements already made and with those in immediate or early prospect, Rockville will occupy an advanced position in sanitation. Hundreds of other towns in the United States are now exposed to danger from insanitary conditions comparable to those which for years have obtained in Rockville and might profit by the above experience.

Dr. Lumsden had the cordial cooperation of the State and local authorities, Mr. H. R. Hall, assistant chief of the bureau of sanitary engineering, Maryland State department of health, having arrived during the investigation and made a detailed sanitary survey of the town. Prof. Phelps, of the Hygienic Laboratory, also advised in the installation of the hypochlorite treatment of the water. Surg. Lumsden's complete report has been published as Public Health Bulletin No. 65.

RURAL SANITATION.

As previously stated, the studies of typhoid fever in country districts have been extended in order to encourage rural sanitation and efficient local health organization. Throughout the rural districts of our country generally conditions favorable to the spread of typhoid infection exist. Sanitary methods of disposal of human excreta and reasonably protected water supplies at rural homes generally are exceptional.

Since urban sanitation has effected a reduction in typhoid prevalence in cities, it was reasonable to assume that improved rural sanitation would also affect favorably the typhoid rate in country districts. It was believed also that a convincing demonstration of the money value of rural sanitation could be made, and that farmers and other country dwellers would be led to take the necessary precautions and incur the required expenses to protect themselves and their families against disease.

In fact, the sanitation of rural communities is one of the most important problems of the Nation; particularly so because of the need of making farm life more attractive in order that a larger proportion of our population will be induced to engage in the industry of food production.

This is difficult, however, because of the present conservative attitude in respect to sanitary needs in country districts and the diffuseness of the problem. A rate of prevalence of typhoid fever which in the average large city would be high enough to cause considerable apprehension occasions little or no concern in the average rural section.

The great sanitary safeguards, such as the installation of public water supplies and sewer systems, which have been so effective for cities, are not as a rule feasible for rural communities. On account of the greater distances to be covered, official supervision over sanitary conditions at rural homes is much more expensive than is similar supervision in city homes, and the receipts from taxation of property and incomes are in proportion to population, as a rule, much less. For these and other reasons rural sanitation depends for its advancement largely upon the observance and practice of sanitary principles by the individual citizens.

Instruction along sanitary lines, combined with efficient local health organization, appears, therefore, absolutely essential for the advancement of rural sanitation. Two plans for imparting this instruction suggest themselves—the one wide in scope but necessarily superficial, the other concentrated and intended to effect a definite demonstration in limited areas.

The first of these plans, consisting of the giving of lectures and distribution of literature, has been earnestly followed by many State health organizations. While the obvious progress has been slow, this method has undoubtedly done good and helps to pave the way for intensive work.

The beneficent effect of the intensive plan, on the other hand, has been demonstrated by actual saving of lives and reduction of sickness. Such results followed the intensive studies in Yakima County, Wash.[1] Before that work was begun by Surg. L. L. Lumsden in 1911 the typhoid death rate was about 200 per 100,000 annually. After the work had been completed the county was left with an all-time health officer and good county health organization, and the typhoid death rate was reduced by over 90 per cent. Since that time deaths from all causes in North Yakima, the county seat, have been reduced by about 45 per cent, which represents a saving of 100 human lives annually in that town.

It seems reasonable to believe that like results might be secured in other counties, although not invariably in every county. To go into a county in which there is no popular demand for sanitary betterment and try to create such demand is an experiment which may prove a great success or partial failure.

On account of the great need, however, for further demonstration of the feasibility of improving rural sanitation and reducing typhoid fever it was determined to select three counties in three different States for intensive investigations. Those selected were Berkeley County, W. Va.; Lawrence County, Ind.; and Union County, Miss. Dorchester County, Md., was subsequently added.

These four counties being widely separated present different conditions, although all have had high typhoid-fever rates. Berkeley County is in a mountainous section, Lawrence County in the Ohio Valley, Union County in the far South, and Dorchester County on the shores of the Chesapeake Bay. Work in the last-named county was not begun until July, 1914.

The conditions giving rise to typhoid fever in country districts and the measures necessary for their prevention taken together constitute in reality "rural sanitation," although housing conditions and conditions favoring the propagation of disease-bearing insects must also be taken into account. It was decided, therefore, not only to make intensive studies of typhoid fever in the manner mentioned, but to undertake also like intensive studies of malaria. These latter will be described under a separate heading (p. 23). Before describing in detail the studies in the counties mentioned it is necessary to mention similar work conducted by the service in rural districts of Virginia.

RURAL DISTRICTS OF VIRGINIA.

In the annual report for 1913, page 20, reference was made to the investigations of typhoid fever in the rural districts of Virginia. These studies were resumed in the summer of 1913, the work being conducted by Surg. L. L. Lumsden and Passed Asst. Surg. Hugh de Valin in cooperation with Drs. A. W. Freeman and J. A. Waddell, of the Virginia department of health. The work consisted of epidemiological studies of numerous outbreaks of typhoid fever in country neighborhoods, small towns and villages, and intensive laboratory studies of the materials collected.

In the summer of 1912 laboratory studies were conducted in the Roanoke health department laboratory. Several hundred samples of water supplies from rural homes were examined bacteriologically, and numerous Widal tests, blood cultures, and examinations of feces and urine made to assist in the diagnosis of doubtful cases. In the course of the work in the summers of 1912 and 1913, 2,000 specimens of feces were collected from persons living in neighborhoods in which typhoid fever was prevalent and examined bacteriologically at the laboratory in Roanoke. Several hundred collections of house flies obtained from the rooms of typhoid-fever patients, from dining rooms, and from kitchens in homes in which typhoid-fever cases had occurred and from insanitary privies were examined for the presence of typhoid bacilli.

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[1] Public Health Bulletin No. 51.

Due to the pressure of other work the data obtained from these extended and intensive field and laboratory studies of rural typhoid fever have not yet been collected and interpreted for publication. The findings in the season of 1913 tended generally to confirm the conclusions reached by the investigators from their epidemiological observations made in the summer of 1911. These conclusions may be found on page 19 of the annual report for 1912.

BERKELEY COUNTY, W. VA.

The high prevalence of typhoid fever in Berkeley County, W. Va., was brought to the attention of the bureau in November, 1913, by the secretary of the State board of health of West Virginia with a request for its investigation.

Surg. L. L. Lumsden was accordingly assigned to this duty, with instructions to make a comprehensive study of the causes responsible for the spread of the disease, the measures necessary for its control, and general sanitary conditions in the county. Asst. Surg. W. E. Glanville was detailed to assist Dr. Lumsden in this work, which was begun on November 14, 1913, in cooperation with the county health officer.

The plan adopted contemplated a house-to-house sanitary survey of all places in the county in which typhoid fever had been highly prevalent, and an educational campaign by means of public lectures, free distribution of literature, and encouragement of the county authorities to expend the necessary funds to secure safe water supplies and install sanitary excreta-disposal systems in the public schools.

A special card was prepared for the collection of pertinent sanitary data during the survey. In this card spaces were reserved for notations in regard to the character, construction, cleanliness, and screening of residences; presence of vermin; drainage; topography; presence of domestic animals; protection of manure; methods of sewage disposal; source and character of water supply; and the prevalence of typhoid fever, precautions taken in caring for patients, and its probable cause.

The sanitary house-to-house survey was begun by Asst. Surg. Glanville on November 15 and continued until December 25, 1913, when it was interrupted on account of weather conditions. During that time 511 rural homes were inspected in several sections of the county, and sufficient data collected to give a fair idea of sanitary conditions throughout the county.

Work in Berkeley County was again taken up by Surg. Lumsden on March 31, 1914. As he was also in general charge of similar work in other States, Passed Asst. Surg. R. M. Grimm was detailed to supervise under Dr. Lumsden's direction the sanitary survey in Berkeley County, six epidemiologists being employed to make the house-to-house canvass previously begun. The county was for this purpose divided into districts, to each of which two epidemiologists were assigned. Dr. Grimm continued in immediate charge of the investigation until May 3, 1914, when he was ordered to Indiana, and his place taken by Passed Asst. Surg. W. M. Bryan, who had been in Berkeley County since April 14.

From March 31 to June 30, 1914, there had been inspected a total of 3,700 private residences, and 11 post offices, 10 railroad stations, 58 churches, 68 schools, etc., and sanitary data collected relating thereto.

Public meetings were held by Dr. Lumsden and his assistants in different parts of the county at the rate of about three or four a week, a total of 22 public addresses being delivered. The immediate results of the campaign were shown in marked betterment of sanitary conditions and an increased popular interest in public health.

In the city of Martinsburg, the county seat, a sanitary method of excreta disposal was adopted, a sanitary inspector provided by the city for the health department, an ordinance for the maintenance of scavenger service enacted, and organizations of women and of business men formed to promote sanitation throughout the county. By June 30, 1914, the woman's sanitary league included over 1,800 members, and the business men's sanitary league over 200. Both these organizations and the local authorities and newspapers offered most efficacious cooperation in the sanitary studies. The people themselves were usually responsive, and welcomed suggestions in regard to sanitary improvements.

While no accurate statistics were available, it was apparent from the data on hand that typhoid fever had been highly prevalent year after year, particularly in the summer season, throughout Berkeley County. In one village with a population of 150, there occurred in the summer of 1913 nine clinically recognized cases of typhoid fever. Estimating the case fatality rate as 10 per cent, this would mean a typhoid fever prevalence nearly 40 times as great as that of the "registration area." Similar conditions were found in other parts of the county.

The privies in use were generally of the open-back surface variety, and often in rural sections located uphill from, and within a short distance of, shallow wells or springs. A large part of the county being hilly and a limestone stratum lying near the surface of the ground, privy pollution of the water supply is always to be feared.

The extensive cultivation of water cress and other vegetables sold in interstate traffic made this condition very serious, since there existed a possibility of having polluted produce shipped to other States.

It is believed that this is the first time an intensive campaign of the scope and character above outlined has been conducted in this country, and it is believed that the results obtained will serve not only to improve substantially sanitary matters in Berkeley County, but also as an object lesson in sanitation to other communities.

LAWRENCE COUNTY, IND.

At the request of the State board of health of Indiana, Lawrence County, in that State, was selected to conduct an intensive survey, similar to that in progress in Berkeley County, W. Va. As in the case of Berkeley County, it was decided that the chief features of the survey would be an investigation of conditions responsible for the spread of disease, and typhoid fever especially, and an educational campaign to arouse the people to the importance of sanitation.

Surg. L. L. Lumsden was also in charge of this survey, which was begun on May 8, 1914. In view of the necessity for his presence in other States where similar work was in progress under his direction, Passed Asst. Surg. R. M. Grimm was placed in immediate charge of the survey, with headquarters at Bedford, Ind. Four epidemiologists were employed under him.

Public meetings were frequently held at various parts of the county. The people showed themselves interested in the work and willing to do their part in assisting it. Cordial cooperation was rendered by the State board of health during the survey. The "health exhibit" was sent by the State health commissioner to Lawrence County, to be shown by an employee of the board at various places in the county during the campaign. Two men were also detailed by the State health commissioner to assist in the house-to-house canvass during part of the time. The commissioner showed in addition his interest in the work by visiting the county accompanied by an assistant.

From May 8 to June 30, 1914, there has been inspected a total of 3,283 private residences, 72 schoolhouses, 47 churches, 10 post offices, 9 railroad stations, 12 dairy farms, and 8 stone quarries.

UNION COUNTY, MISS.

The State board of health of Mississippi having requested that studies in the interests of better rural sanitation be conducted in that State, Union County was selected after conference with them for special investigations. As in Lawrence County, Ind., and Berkeley County, W. Va., the two prominent features of the work were surveys of sanitary conditions and education of the people by means of addresses, bulletins, advice, etc.

Surg. L. L. Lumsden was also placed in charge of this work, which was begun on June 17, 1914. During his absence in other States Acting Asst. Surg. H. C. Yarbrough assumed the immediate direction. In addition to Dr. Yarbrough, 3 epidemiologists and 1 attendant have been employed in the work in Mississippi.

The director of public health and sanitation in that State and the local health organization had been preparing the people for the campaign, and the results of their preliminary work were evident in the enthusiasm shown at the public meetings and the reception accorded the investigators on their visits.

From June 17 to June 30, 1914, there had been inspected a total of 855 residences and 29 schools, railroad stations, churches, post offices, etc. Six public meetings were also held during the same period, at all of which addresses of an educational character were delivered.

RESULTS OF RURAL SANITATION WORK.

A total of 15 officers have been engaged in these epidemiological surveys in the counties mentioned. From the beginning of the work to June 30, 1914, there had been visited 8,349 rural homes, 156 schoolhouses, 24 post offices, 20 railroad stations, 114 churches, and 8 stone quarries. Nearly 10,000 pieces of literature had been distributed and 36 health talks given. In every county the State and local health authorities assisted greatly in the work, and the people were deeply interested.

So far as known this is the most extensive survey of its kind yet made, and immediate results should follow and be demonstrable by lessened death and sickness rates. The taking up of similar intensive surveys by State and local health authorities in all the States would do more to improve rural sanitation and to secure full-time local health officers than any other single measure that could be devised. It is expected to continue the work during the current year, and provision should be made for its extension by the service.

RAILROAD SANITATION.[1]

A number of studies were conducted during the year having a bearing on railroad sanitation, especially in so far as related to interstate traffic.

GASEOUS IMPURITIES IN RAILWAY TUNNELS.

The various phases of the smoke problem, as is well known, have received much attention at the hands of investigators. Considerable progress has been made in reducing the amount of smoke produced by the furnaces of factories, power plants, etc., but in the case of locomotives no material advance appears to have been made. Need for this is, of course, felt mainly in the larger cities where many trains gather simultaneously and are the source of large part of urban soot and its accompanying discomforts. There is, however, another side of the question to which attention might profitably be given, namely, the possibility of the dangerous contamination of the air of tunnels by heavily loaded locomotives passing through them. The difficulty of providing for the rapid escape of smoke from tunnels and the consequent opportunity for the accumulation of injurious gases when trains pass through in rapid succession furnish a condition for possible dangers, which has so far apparently received little consideration.

Realizing the importance of the subject, Technical Assistants A. Seidell and P. W. Meserve, of the Division of Pharmacology, Hygienic Laboratory, were instructed to conduct a series of experiments to determine what is the average and maximum amount of such poisonous gaseous impurities as sulphur dioxide and carbon monoxide in the air of a representative tunnel through which only trains drawn by coal-burning locomotives pass and in the air of a similarly representative tunnel through which the trains are drawn by electric tractors.

The tunnels selected are both in the city of Baltimore, Md., namely, the Fulton or Baltimore & Potomac Tunnel of the Pennsylvania Railroad, located between Fulton and North Avenues, and the electrified tunnel between Camden and Mount Royal stations of the Baltimore & Ohio Railroad.

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[1] See also Tuberculosis, p. 40.

The results of the analyses of 88 samples of air from the two tunnels showed that on an average there is approximately five times as much of each of the two gases in the Fulton as in the electrified tunnel. In the case of the Fulton Tunnel, the highest amounts were 15.1 parts of sulphur dioxide per million and 267 parts of carbon monoxide per million. The corresponding figures for the electrified tunnel were, respectively, 2.9 parts and 25 parts.

A review of the available literature upon the physiological effects of small amounts of carbon monoxide and sulphur dioxide showed that the concentrations of these gases, which produced an unmistakable harmful effect upon man, were somewhat greater than the maximum amounts which were found in any of the tunnel-air samples.

In regard to constant sources of minor injury which smoke-laden tunnels may cause to patrons and employees of railroads generally, no data are at present available. It is apparent that actual conditions will vary with every tunnel considered. Such factors as length of the tunnel, its grade, provisions for ventilation, and, above all, the amount of traffic through it, play the principal part in determining the amount of dangerous gases which will be present.

The complete report of Messrs. Seidell and Meserve on the subject has been published as Hygienic Laboratory Bulletin No. 92.

WATER USED BY COMMON CARRIERS.

At the suggestion of the director of the Hygienic Laboratory, Passed Asst. Surg. R. H. Creel undertook a study of the sanitary quality, as determined by bacteriological methods, of the waters found on common carriers entering the city of Washington. At the close of the fiscal year he had practically completed the examination of 1,000 samples of water so obtained, and is now engaged in the preparation of his report thereon. This series of examinations is the most extensive that has been made of the water from common carriers coming from diverse localities of the United States, and it is believed that Dr. Creel's results will furnish important data in regard to the sanitary quality of the water aboard trains and vessels.

EXCRETA DISPOSAL ON RAILWAY TRAINS.

The importance of preventing, in some way, the indiscriminate discharge of excreta from railway trains is a matter of common knowledge among sanitarians. The present expedient of locking toilets while passing over the watersheds of city supplies is at best but a makeshift and partial remedy. Suggestions have been made and seriously considered to store this material and to discharge it at railroad terminals. In consequence of the considerable amount of space which such a project would necessitate, and the difficulty of preventing the storage tanks from freezing during cold weather, there are many complicating features connected with the terminal facilities for the final disposal of the tank's contents.

Some serious attention has been given to this matter by the Division of Chemistry, Hygienic Laboratory, and as a result an apparatus has been designed for the temporary storage of the excreta and for its sterilization by steam by means of an automatic apparatus. In the winter time the waste steam from the heating system will probably suffice for this purpose. The contents of the tank would be rather well digested by the sterilization process, and when sufficiently heated would be automatically discharged in a slow stream. The apparatus requires but little space for installation, and its use appears at present to be entirely feasible. Experimental models have been constructed to develop the automatic mechanism, and a full-scale model is now under construction for actual test. The installation of a satisfactory apparatus of this character upon steamboats plying in fresh waters, especially upon the Great Lakes, would be a distinct advantage.

Studies of School Hygiene.

During field investigations of public-health matters carried on within the year opportunity was presented also to make observations of the sanitary conditions of a large number of schools in different parts of the country. A total of more than 1,000 schools, mostly rural, were thus inspected in 10 States.

Increasing attention by authorities in urban communities is being devoted to this subject, but in most rural sections little or no attention has been given to the sanitation and construction of rural school buildings or the medical supervision of pupils. This is due partly to financial conditions and sparse populations and partly to lack of local health organization.

According to the census of 1910 there were 10,529,871 pupils in attendance at rural schools as compared with 7,480,000 in urban schools. On account of the preponderance of the rural school population, therefore, and the insanitary conditions under which many of them live and attend school, there is need of special studies to devise uniform and practical methods for the protection of their physical and mental status while engaged in an occupation which in most States is compulsory.

The studies mentioned and subsequently described were undertaken to determine actual conditions in widely separated areas and to ascertain the influence of schools as factors in the health of communities. Schools are capable of becoming important agents in the control of communicable diseases and the improvement of health conditions generally. It is accordingly the intention to extend these studies both by general and intensive methods so as to encourage more efficient local health administration.

SANITARY SURVEY OF SCHOOLS IN NORTH AND SOUTH CAROLINA.

In connection with the investigations of trachoma being conducted by Passed Asst. Surg. A. D. Foster a survey was also made to determine the sanitary conditions present in the schools of North and South Carolina. This survey lasted from November 26, 1913, to April 22, 1914.

In the mountainous sections the special feature of the work was an investigation of the prevalence of trachoma. (See p. 34.) In the lowland section of South Carolina, in addition to the examinations for trachoma, a general physical inspection of the children to detect the presence of any preventable and remediable defects and a sanitary inspection of school buildings and grounds were made. A total of 107 white and 16 colored schools were inspected and 14,119 white and 2,327 colored children examined.

General physical examinations were only made at the specific request of the local authorities in the case of 2,365 pupils in the schools of Florence, Effingham, Darlington, McColl, Little Rock, Conway, and Horry County, S. C. Of these, 1,682 were white and 683 colored; 1,391 physical defects were found among the white children and 809 among the colored. The most common defects were enlarged tonsils, adenoids, defective vision, defective teeth, and enlarged cervical glands. Among the other conditions noted were 8 cases of defective hearing, 18 of anemia, 6 of defective speech, 4 of syphilis, 4 of pellagra, 2 of goitre, 2 of feeble-mindedness, 3 of tuberculosis, 2 of suspected tuberculosis, 1 of hydrocephalus, 2 of impetigo contagiosa, 1 of curvature of the spine, 25 of follicular conjunctivitis, and 1 of trachoma.

In regard to the sanitary condition of the schools, it was observed by Passed Asst. Surg. Foster that in the larger cities most of the school buildings were of modern construction, special attention having been given to proper heating, lighting, and ventilation. In such places the sanitary condition of the schools was, as a rule, good. A similar, if not so pronounced, progress was also apparent in the smaller towns.

It was in the rural schools that the need for sanitary improvements was most noticeable. The usual method of heating these schools is by means of ordinary wood stoves or trash burners, a very unsatisfactory way, since this type of heater requires constant attention and heats the rooms unevenly. In scarcely any of the schools was any provision made for furnishing moisture to the air, this being an important factor in the causation of diseases of the air passages, in addition to causing a needless waste of fuel.

In the large majority of the rural schools visited by Dr. Foster the toilet facilities were entirely inadequate and often insanitary. The open privy was generally used, in many cases not even provided with a pit to receive the excreta. In many of the closets the doors were broken down and no screening against flies practiced. It must be remarked that proper disposal of excreta is of especially great importance in sections infected with hookworm and where children go barefooted in summer.

In many of the rural schools, common drinking cups had been barred, and individual cups were in general use by the children.

In order to stimulate interest in the adoption of measures for medical inspection of school children, conferences were held with local health and school authorities, and talks on sanitation delivered before teachers and pupils of the schools visited.

SANITARY SURVEY OF SCHOOLS IN MOUNTAIN COUNTIES OF WEST VIRGINIA AND VIRGINIA.

Opportunity was taken by Surg. T. Clark to make during his investigations of trachoma in West Virginia and Virginia observations as to the sanitary condition of rural schools in the area visited by him.

In all, 199 schools, 138 rural and 61 urban, were inspected by Dr. Clark. Owing to the necessity of completing the investigations within a reasonable period of time, a detailed examination of the schools was not undertaken by him. His observations seemed to justify the conclusion that there is a general lack of sanitary supervision over the construction and maintenance of rural school buildings and over the physical welfare of the children.

Not a single sanitary privy was found in all the rural schools inspected. In numerous instances no privy accommodations whatsoever were provided, and soil pollution in the neighborhood of the schoolhouses was evident. In one county 11 cases of typhoid fever, with 2 deaths, were traced to the infected wells of 2 schools during the year preceding Dr. Clark's investigations. In 21 rural schools over 10 per cent of the pupils were found to be suffering from trachoma and in 11 schools over 20 per cent. In 4 schools the rate of trachoma infection was 35.29, 42.30, 43.75, and 46.15 per cent, respectively.

The sanitary needs revealed by this school survey were many. The faults in the location, construction, and maintenance of school buildings must be attributed to the lack of skilled advice, while medical inspection of school children would serve to indicate and correct remediable and preventable physical defects among the children.

SANITARY SURVEY OF SCHOOLS IN EAST TENNESSEE AND NORTHERN GEORGIA.

In connection with his investigations of trachoma (see p. 34) an investigation was made by Acting Asst. Surg. C. A. Bailey of sanitary conditions in the rural schools of east Tennessee and northern Georgia. The investigation was begun December 8, 1913, and terminated April 24, 1914.

One hundred and twenty-two white schools and four colored schools were visited in various sections of 31 counties of east Tennessee, and 79 white schools and 5 colored schools in 25 counties in northern Georgia. On account of the limited time available no attempt was made to undertake a systematic physical examination of the school children.

In the inspection of the buildings and grounds, attention was paid to the following points: Drainage, sewage disposal, water supply, drinking utensils, lighting, color of walls, heating and ventilation, cloakrooms, washing facilities, kinds of seats, location of blackboards, and condition of classrooms.

In Tennessee 100 schools had good and 26 poor drainage; in Georgia 68 had good and 16 poor drainage. In a few instances surface outhouses were situated higher than the school ground and wells. The most serious defect noted consisted in insanitary methods of excreta disposal. The vast majority of the outhouses were set on the ground and belonged to the open-back variety, allowing free access to flies and animals. No provision was made in most cases for the removal of contents. In many instances the schoolhouses themselves were found filthy and insanitary. In the entire section visited only six sanitary pail privies were observed and only one school was equipped with a septic tank.

The sources of water supply were dug and driven wells, springs, or city water supply. The largest majority of the wells allowed refuse water to drain into them on account of the condition of the covers. Common drinking cups were found in use in many schools. On the whole, the lighting area of schoolrooms was adequate. In a number of cases, however, the existence of cross-lights was noted.

The largest number of schools were heated by old-fashioned stoves, not one "sanitary" heater being seen. The most common method of ventilation was through the open windows, the ventilation being in many schools decidedly bad. In only 12 of the 230 schools inspected were washing facilities provided. Not one of the schools was equipped with adjustable seats. The largest proportion of the blackboards were poorly located. Only one-third of the schools were in a clean condition, the rest being either only fairly so or dirty.

SANITARY SURVEY OF SCHOOLS IN JEFFERSON COUNTY, KY.

On request of the State and local health authorities, Surgs. J. H. Oakley and D. Moore and Passed Asst. Surg. L. Kolb were directed to make a sanitary inspection of the schools of Jefferson County, including the city of Louisville, Ky., for the particular object of ascertaining the prevalence of trachoma among school children. The work was begun December 7, 1913, and terminated February 14, 1914.

A total of 239 schools was inspected, 106 being rural and 133 urban, 168 public and 71 parochial, private, etc. The number of pupils examined was 35,297, of whom 4,731 were colored and the rest white.

Eight hundred and five undoubted cases of trachoma and 328 suspicious cases of eye disease were found among the children examined, the amount of infection being 2.26 per cent among the white children and only 0.09 per cent among the colored. That is to say, the disease was twenty-five times more prevalent among the white. The percentage of infection in the rural and urban schools was nearly the same, although it was most prevalent in the "homes" and orphanages of the city.

A large group of the cases detected could be traced to family groups or orphanages or similar institutions, it being the opinion of the investigators that the use of the common towel and wash pan in the schools and homes had been the chief agent of infection.

Very few cases of contagious skin disease were found in the rural schools, the schools well out in the country being practically free from such diseases. Skin disease was also rare in the city schools. A number of cases of ringworm were observed, it being more prevalent among colored than among white children. Pediculosis was almost absent in the Louisville schools.

The complete report of this investigation has been published in the Public Health Reports of May 29, 1914.

SANITARY SURVEY OF SCHOOLS IN BARTHOLOMEW COUNTY, IND.

Upon the request of the county health commissioner and the secretary of the Indiana State board of health, Surg. J. A. Nydegger was detailed to make a sanitary survey of the schools in Bartholomew County, Ind. The survey continued from September 23 to October 13, 1913, and included a medical inspection of the school children and a sanitary inspection of the school buildings, grounds, etc.

In all, Dr. Nydegger visited 83 schools and inspected 3,969 school children. The children examined seemed generally in good health and well nourished. The occurrence of contagious and infectious diseases among them was especially sought for, particular attention being paid to trachoma and defective oral and pharyngeal conditions, organic diseases, deformities of back and limbs, defective hearing, defective speech, and mentally dull and backward children.

Of the children 1,435, or 38.67 per cent, had defective teeth; 539, or 14 per cent of the total number examined, had enlarged tonsils. Three cases of impetigo contagiosa were observed in one school, all members of the same family. A total of 48 cases of trachoma were found in 20 schools, or 1.2 per cent prevalence among the children. The disease was most prevalent in two townships, Columbus and Wayne, 34 cases being found in them. Twenty cases of follicular conjunctivitis were observed in 14 schools, mostly rural.

In the sanitary inspection, attention was paid to the following details: Area and condition of school yards, drainage, outhouses and excreta disposal, water supply, drinking utensils, disinfection and cleansing of school buildings, lighting, color of walls and ceilings, heating, ventilation, cloakrooms, facilities for washing, kinds of towels, kinds of seats, and location of blackboards.

The complete report of this investigation was published in the Public Health Reports of February 6, 1914, and issued as Reprint No. 177.

SANITARY SURVEY OF NATIONAL JUNIOR REPUBLIC, ANNAPOLIS JUNCTION, MD.

At the request of the Maryland State Board of Health, Surg. T. Clark was directed to make a mental and physical examination of the inmates of the National Junior Republic, an institution for persons of from 15 to 21 years of age who have shown tendencies toward a vicious life, located near Annapolis Junction, Howard County, Md., and also an inspection of its buildings and grounds. This survey was made May 27–29, 1914.

A total of 44 inmates were examined, 40 boys and 4 girls. Among these the following defects were discovered: Adenoids, 1; backward and mentally defective, 13; color blind, 1; decayed teeth, 37; defective hearing, 4; defective vision, 14; diseased tonsils, 8; enlarged thyroid, 3; flat foot, 3; heart disease, 2; and malocclusion, 3.

The site of the institution was found to be healthful, well drained, and shaded, the buildings detached and not too close to each other, and the neighborhood free from stagnant pools and other nuisances. The water supply being obtained from a shallow, driven well, there was danger of contamination by seepage in case of a faulty or broken connection of the sewer pipe which passes within a few feet. The sewage disposal methods were found unsatisfactory, the privies in use being in an insanitary condition. Screening against flies was observed not to be general. One of the dormitories was also found to be inadequate, from a hygienic standpoint, for the purposes intended, since the lighting, heating, bathing, and toilet provisions were obviously unsuitable.

Specific recommendations for the improvement of the sanitary defects noted were submitted by Surg. Clark to the officers in charge of the institution.

INTENSIVE STUDIES OF THE PHYSICAL AND MENTAL STATUS OF SCHOOL CHILDREN.

In order to determine the bearing of physical and mental status on the progress of school children, the service is now conducting at Wilmington, N. C., under the supervision of Prof. C. W. Stiles, a series of studies on all of the school children of a certain county. The work is progressing very satisfactorily, and it is hoped that during the coming year it will be possible to begin the publication of some of the results.

A certain number of children of different ages are being examined in certain definite groups. On a given day, say, the 15th of January, certain tests were given to all of the children who reported for the inspection, and who were born on the 15th of January, 15th of April, 15th of July, or 15th of October. By following this plan for three months, the school children of any given year of age naturally fell into four definite groups. For instance, the 10-year-old children were exactly 10, or $10\frac{1}{4}$, or $10\frac{1}{2}$, or $10\frac{3}{4}$ years old. By adopting this method it is hoped to obtain standards for comparison. The ultimate results of this plan can not be foreseen until the work is more advanced.

MEDICAL INSPECTION OF SCHOOL CHILDREN.

The movement for the medical inspection of school children is spreading very satisfactorily, and its growth seems to be a healthy one. Despite opposition in some quarters the public, and especially the school teachers, are asking for a more general adoption of the system.

The school problems in regard to medical inspection vary naturally somewhat in different parts of the country, despite the fact that the general basis for the system remains the same in all of the different States. In connection with the mental tests that the service is making on school children, an effort is being made to standardize for the American school children of different ages some of the tests now being used at Ellis Island, N. Y., in the examination of immigrants.

There is need not only for more careful sanitary supervision of schools, but for definite control of the amount of work that shall be required of each pupil as determined by its physical and mental status. In order to meet these needs, reasonable and uniform standards will be required, and local organization developed to enforce them. On account of the intimate relation of schools to the health of communities, medical school supervision is in reality a function of health authorities. By thus combining it, in many sections the employment of full-time health officers would become possible, whereas, under present conditions, on account of lack of funds neither medical school inspection nor health work receive adequate attention.

PUBLIC HEALTH ORGANIZATION AND ADMINISTRATION.

Reference has been made in the annual reports for 1912 (p. 39) and 1913 (p. 47) to the studies of State health legislation conducted by this service. It was a logical step to undertake a more intensive investigation of State and local public health administration to see the operation of these laws.

HEALTH ORGANIZATION IN MARYLAND.

An invitation of the State Board of Health of Maryland furnished an excellent opportunity for this purpose, and Surg. C. Fox was directed to proceed to that State to make a study of the State department of health and other agencies discharging sanitary functions.

His investigations began in July, 1913, and continued for a period of approximately six months. Among the matters considered by him were the organization of the State board of health; its executive officers and their powers and duties; the duties of the several bureaus and the facilities for their work; the provisions in law for the control of disease and their workings in actual practice; the abatement of nuisances; the dissemination of sanitary information; the inspection of such establishments as factories, canneries, dairies, public buildings, restaurants, etc., and public conveyances; control of milk supply; school sanitation; field work by the State authorities; local health organization; relation of the State to the local health organization; appropriations available for health work to the State and local health authorities, etc.

As a result of these studies Dr. Fox reached certain conclusions, which were embodied by him in a series of recommendations having for their object the securing of greater efficiency and the development of a coordinated health organization in both State and counties provided with the necessary funds for effective work. Some of these recommendations were acted on immediately by the State board of health, such as the adoption of a standard working day of 7 hours at the executive offices, preparation of a new birth-certificate form, installation of tabulating machines, use of maps to trace the prevalence of communicable diseases, etc. Others, such as the formation of a State force of field inspectors, larger appropriations for the State board of health, etc., were the subject of legislative acts by the State assembly.

Dr. Fox's complete report has been published as Reprint No. 166 from the Public Health Reports.

HEALTH ORGANIZATION IN MASSACHUSETTS.

On request of the governor of Massachusetts, Asst. Surg. Gen. J. W. Kerr was detailed April 9, 1914, to attend a conference at the statehouse, Boston, called to consider revision of the health laws of the State relating to organization of the State board of health. At this conference, which was presided over by the governor, were the chairmen and certain members of the respective committees on health in the two houses of the legislature, a member of the State board of health, two members of the commission on economy and efficiency, and others.

After several sessions of the conference, certain conclusions were reached as to what should guide in the organization and conduct of the State health body. These conclusions, it is understood, were used as the basis of a measure which was introduced in the legislature. Briefly, they were as follows: (1) Health administration on behalf of the State should devolve on a single well-paid executive. (2) There should be an advisory council with quasi legislative and quasi judicial but no executive powers. (3) The executive and scientific work should be handled in eight appropriate divisions in the immediate charge of competent, all-time, well-paid, division officers. (4) The State should be divided into eight districts and each district provided with an all-time adequately paid field health officer. (5) The advisory council should have, among other duties, authority to formulate and issue health regulations of State-wide application. (6) The State health department should have supervision over matters directly affecting the public health, including control of communicable diseases, tuberculosis being particularly mentioned. (7) It should also have sanitary control over milk supplies.

In addition to the above, other detailed matters such as method of appointment, tenure of office, etc., were considered, all being embodied in an informal report of the conference.

REQUESTS BY STATE AUTHORITIES FOR STUDIES OF HEALTH ADMINISTRATION.

Subsequent to the publication of results of studies already made, requests have been received from the State commission on economy and efficiency of Illinois, and the State Boards of Health of Minnesota, Washington, Kansas, and West Virginia. Surg. C. Fox commenced on June 8 this study in Minnesota, and an officer is expected to go to Illinois for a like purpose. Requests from the other States mentioned will be taken up as soon as officers are available.

COOPERATION WITH HAWAIIAN AUTHORITIES.

During the year Surg. McCoy continued to act as sanitary adviser to the governor of Hawaii. An inspection trip, having in view chiefly a further study of the plague situation on the island of Hawaii, was made by him in October, 1913, at the request of the president of the Territorial board of health.

Although active antirodent measures are carried on, cases of plague occur from time to time in the Hamakua district of Hawaii, and rat infection continues to be found, though neither human nor rat cases are numerous enough to be alarming.

The board of health has a rat catching and poisoning force throughout the district as well as in Hilo, and all rats taken are examined at the laboratory in Hilo. Considering the resources at the disposal of the local authorities, it did not appear that anything more could be done.

While in Hilo an inspection was made with the board of health of a large area of low-lying, more or less flooded, land. This tract was condemned by the board and arrangements were begun for filling and draining it.

It was found that excellent sanitary work was being done on the island of Hawaii. Two examples may be mentioned—sanitary pig pens, which are essential in populous districts, and concrete pillars that the large lumber companies have erected on which to pile lumber. The latter do away with rat harbors that are among the most difficult to deal with.

As a result of the work participated in by Dr. McCoy there has been a steady improvement in sanitary conditions in Honolulu during the year. The filling of Kewalo ponds and lowlands has been carried on by the Territorial authorities as rapidly as various injunctions and other legal embarrassments would permit. The mosquito nuisance has been much decreased by this work, and the extension of the sewer system has contributed largely to the same end by doing away with cesspools.

COOPERATION WITH PORTO RICAN AUTHORITIES.

At the request of the Governor of Porto Rico, Surg. W. W. King was detailed on September 20, 1913, for duty with the Institute of Tropical Medicine and Hygiene of Porto Rico. This detail was in addition to his duty as chief quarantine officer for Porto Rico, since circumstances rendered it necessary to retain Surg. King in charge of the quarantine service.

The institute is an organization of the government of Porto Rico for the study of diseases of that country and climate, and is composed of physicians with special experience in such lines. The other members are Dr. Pedro Gutiérrez Igaravídez, director; Dr. Víctor Gutiérrez Ortiz, secretary; Dr. Isaac González Martínez, director of the biological laboratory of the sanitation service; Dr. William F. Lippitt, director of the sanitation service of Porto Rico. Maj. Bailey K. Ashford, Medical Corps, United States Army, having been detailed for similar studies in Porto Rico, collaborated with the institute, although not a member of it.

At the time Surg. King began his connection with the institute there was being organized a temporary clinic in the mountains of the interior, with a view of making investigations into the diseases of the rural population, relieving their medical necessities, and obtaining such data and material as might be possible for study later in the laboratory of the institute at San Juan.

The clinic was established near the town of Utuado, a location convenient to a district of some 40,000 people. Because of the known prevalence of uncinariasis arrangements were made with the director of sanitation for the anemia service under his direction to furnish personnel, drugs, and supplies for the treatment of such cases, and this phase of the clinic's work was kept separate, although under the working supervision of the members of the institute.

Patients went first to the clinic for uncinariasis, where one of the four physicians of the anemia service examined and prescribed for that disease. If the patient was found not to have that affection, or was suffering from complications or some other disease, he was referred to the clinic of the institute, where one of the members examined and treated him.

A temporary 30-bed hospital was established in a near-by building for the reception of cases demanding continuous attention, care, or study, and for those patients too ill to return immediately to their homes.

That the benefits of this medical expedition were appreciated by the people is evidenced by the large numbers attending the clinic. Within a week the attendance ran over 500 persons, and later more than 1,000 new and returning cases were treated on certain days. These large numbers required so much time that the research work of the institute was interfered with to a certain extent. However, much was accomplished and valuable material was obtained for later study.

This expedition of the institute lasted 10 weeks, the clinic being open every day except Sundays. During the 60 working days of this period 10,140 persons were registered, of whom about 2,500 were also admitted to the general clinic of the members of the institute, but only 1,923 were recorded under that head. The balance were clearly trivial affections, or being cases of uncinariasis only, were carried on the record of the special uncinariasis clinic. Ascariasis was found widely prevalent among these patients, adults as well as children, and was generally treated at the uncinariasis clinic.

While the cases treated by the institute members represent approximately the bulk of diseases, other than uncinariasis or ascariasis, among the 10,140 persons examined, it must be pointed out that with the large daily attendance it was not possible to find out all pathological conditions, especially those in which the symptoms are slight, or vague, or whose nature deterred the sufferers from consulting a physician at a clinic where privacy was not always possible.

It very frequently happened that a patient had more than one disease. In such case, a primary diagnosis was made of the most important condition and a secondary diagnosis of the complicating or intercurrent affection. Secondary diseases numbered 1,991, making a total of 3,914 diseases among 1,923 patients.

They were classified as follows:

	Number of diseases.	Primary cases.	Secondary cases.	Total cases.
Diseases due to animal parasites	14	578	1,425	2,003
General infectious diseases	6	82	15	97
Tropical diseases of uncertain origin	4	25	10	35
Diseases of the skin[1]	37	280	95	375
Diseases of the digestive tract	15	198	96	294
Disease of the respiratory tract	18	183	95	278
Diseases of the eye	14	114	60	174
Diseases of the ear	3	18	3	21
Genito-urinary diseases	21	66	23	89
Diseases of the nervous system	20	93	62	155
Constitutional diseases[2]	11	115	39	154
Diseases of the circulatory system and blood	4	31	8	39
Gynecological diseases[3]	18	70	48	118
Surgical diseases	42	70	12	82
	227	1,923	1,991	3,914

[1] Unclassified, 38 cases. [2] Undiagnosed, 23 cases. [3] Undiagnosed, 2 cases.

A few of the cases above noted have such importance as to merit special mention.

Diseases due to animal parasites.—The percentage of persons infected with animal parasites in the country is abnormally large when compared with that obtaining in the large towns. As many of the diseases caused by these parasites have special influence upon the laboring man's efficiency, the importance of combating them assumes increased importance in the light of their extensive prevalence as revealed by this investigation.

Uncinariasis.—About 70 per cent of the 10,140 persons were found infected with *Necator americanus.* In 1904 when the campaign against the disease was initiated in the Utuado district by Drs. Ashford, Gutiérrez Igaravídez, and King, and in Mayaguez by Dr. González Martínez, the percentage of infection was fram 90 to 98. In 1904 the average hemoglobin percentage in 579 country people was 43.09. At the clinic in 1913 a similar series of blood examinations made in the same number of persons gave a hemoglobin percentage of 72.22.

The effect of nearly 10 years' campaign against this disease was also shown by the change in the prevailing type of the anemia from a majority of intense or medium cases in 1904 to light cases in 1913. Moreover it was observed that the hemoglobin percentage is a rough index to the laboring capacity of the individual, hence the above figures show a gain of nearly 30 per cent in efficiency. Notwithstanding this betterment in the degree of anemia, uncinariasis still remains the most important disease of rural districts.

Ascariasis.—The degree of infection found among these persons was almost beyond the comprehension of anyone who has not worked with a microscope among them. The infection is not only widespread in the community, but often very heavy in the individual and affects all ages. It was found that special care should be taken in administering santonin to young children.

Schistosomiasis.—This is an infection by the *Schistosoma mansoni,* which, localizing itself in the colon and rectum, gives rise to dysenteric symptoms. It is closely allied to the "bilharzia" (*Schistosoma hæmatobium*) of Egypt, which causes serious lesions of the genitourinary tract. Most of the cases found were light infections rarely causing severe symptoms. The majority of the patients lived near the rivers Viví and Grande and bathed in these streams.

Malaria.—Only eight cases coming from two foci were found in spite of the fact that the parasite was sought in many persons who gave histories suspicious of possible malarial infection. The Laverania malariæ was found in six cases and the Plasmodium vivax in two cases.

Although "malaria" is a favorite diagnosis in Porto Rico, the few cases encountered among so many persons apparently bear out the contention, expressed in reports of earlier work by these physicians, that malarial fever is comparatively rare in the interior of Porto Rico.

Filariasis.—While filariasis is a common infection in the coast districts, no case was found in any of the above series. While it is true that only a limited number of night examinations were made, only five persons gave histories suggestive of the disease.

Amebiasis.—This infection was found in only three cases and apparently is not common in that district. However, the case histories of many people suggest that there may be a seasonal or irregular epidemical appearance of the disease.

Tuberculosis.—This disease was not found as prevalent as had been anticipated. There were 56 cases positively determined and 11 suspected. Possibly some cases of chronic bronchitis would have been found to have been tuberculosis had it been possible to obtain the sputum, but generally in all cases of persistent cough or other suspicious symptoms a sputum examination was made.

La "Bonita."—This condition is mentioned because the country people consider it a disease entity. Its features are acute onset, anasarca, frequently nephritis, and a very grave prognosis. Its identity is still under discussion and investigation.

Sprue.—Eleven positive cases of sprue were found and 19 others which gave more or less suspicious symptoms. The majority of cases were town dwellers.

Skin diseases.—The large number and variety of skin diseases were remarkable, and it will be one of the particular fields of future work. Eczema, varieties of tinea, ulcers, and pus infections were notably frequent.

Trachoma.—Surg. King examined a special series of 600 persons, taken at random, to determine the prevalence of trachoma. It was observed in 15½ per cent of these persons.[1]

Gynecological conditions.—It was evident that the number of gynecological cases does not reflect the prevalence of such diseases. It can be readily understood that the circumstances under which the clinic was necessarily conducted were particularly adverse to the revelation of this class of diseases.

Deaths.—It was impossible to learn of all deaths occurring among the patients, yet the effort was made to get all possible knowledge of them. Information was obtained of 26 deaths of persons registered at the clinic. It was also learned that a number of these deaths were caused by diseases other than those for which they had been treated at the clinic, such as acute peritonitis, puerperal fever, enteritis, etc. Two autopsies were obtained.

During the 10 weeks about 36,000 visits were made by patients to the clinic, 72 patients were treated in hospital, 59 surgical operations were performed, and considerably more than a thousand routine laboratory examinations, exclusive of microscopic examinations for diagnosis of uncinariasis.

Since the closing of the clinic at Utuado, the members of the institute have been engaged in equipping a new laboratory, tabulating cases and records of the clinic, and studying data and material obtained in clinical work. Members of the institute will publish individual reports of their special investigations from time to time.

SANITARY ADMINISTRATION IN BALTIMORE, MD.

In connection with the investigation of sanitary organization and administration in Maryland, a study of the health department of the city of Baltimore was made by Surg. C. Fox. This study occupied about four months, from February to May, 1914, and comprised investigations into office methods as well as surveys of field operations with inspectors of the department.

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[1] See also p. 35.

This study embraced the following points: Administrative office, control of communicable diseases, food and dairy inspection, bacteriological work, registration of births and deaths, tenement-house inspection, medical inspection of school children, control of nuisances, inspection of plumbing, maritime quarantine, secretary's office, appropriations, field force, transportation facilities, and miscellaneous public health work in charge of the department.

As the result of the careful consideration of each of these subjects, a number of specific recommendations were submitted by Dr. Fox for the reorganization and conduct of the health department of Baltimore.

Surg. Fox's complete report has been published as Reprint No. 200 from the Public Health Reports.

SANITARY SURVEY OF ST. JOSEPH, MO.

At the request of the local authorities, approved by the State board of health, Surg. J. H. White was directed to conduct a sanitary survey of St. Joseph, Mo., especially with a view to make recommendations in respect to health organization and administration in that city.

Surg. White arrived in St. Joseph on February 1, his survey of local conditions continuing until March 7. During this period of time, he paid special attention to the city water supply, milk supply, food inspection, disposal of garbage and waste, regulation of privy vaults and cesspools, sewerage and drainage, isolation hospitals, reporting and care of infectious diseases, promiscuous spitting, public convenience stations, and care of the poor.

The results of his studies were summarized in the following recommendations:

The city board of health as now organized consists of three members, one of whom is president and executive officer, and none of whom receive any compensation. There is only one possible way to provide the city with a surely and continuously good health system, viz:

The provision of a health budget of not less than 50 cents per capita of population and the employment of a commissioner of public health, with compensation sufficient to justify the giving of his whole time to the service of the city. Such an appropriation would provide for the additional inspectors needed, as well as for the pay of the commissioner of health. The board of health can then give the city the benefit as now of their mature judgment, but would have no administrative work thrust on them as now happens.

Water.—The supply furnished by the waterworks company is good potable water and is used by approximately 75 per cent of the people. The remainder use water from wells and cisterns, many of which are of exceedingly doubtful character. The only solution of this question is prompt and vigorous action by the law officers of the city in enforcing the ordinance closing polluted wells and cisterns.

Milk and food.—The milk supply of the city on the whole appears to be good, and great care is exercised by the board to maintain the quality. No comment is required beyond the suggestion that the score-card minimum be raised to 60 in a possible 100. Food products are inspected under State law and the condition, while not ideal, is as good as could be obtained without a greater inspection force. Betterment can be obtained by employment of an additional food inspector and vigorous enforcement of the State laws.

Sewers are as good as the conjoint system of sewer and storm drain can ordinarily be, fairly sufficient in extent, and are being extended all the time. Privies and cesspools are far too numerous and constitute, like garbage, one of the most serious problems confronting the board. No effort should be spared toward enforcing sewer connection, and it is the manifest plain duty of the city common council to extend the sanitary district at once.

Garbage and waste conditions are undeniably bad and need correction. The remedy is separation into—ashes, to be used as filling or dumped; trash, to be used as filling or dumped; manure, to be carted to farms or dumped; garbage, to be fed to hogs, collection being made by the city through its own agencies. Night soil is very well disposed of, but this matter should be met by enforcing complete connection of premises with sewers.

Surg. White's complete report has been published as reprint No. 185 from the Public Health Reports.

COOPERATIVE HEALTH WORK IN MASSACHUSETTS.

From November 1, 1913, to April 1, 1914, an experiment in cooperative health administration was conducted in Massachusetts under the supervision of Prof. E. B. Phelps, professor of chemistry at the Hygienic Laboratory, who had become connected with this work since April 1, 1913, while on the staff of the Massachusetts Institute of Technology. To assist him a sanitary bacteriologist was assigned to this work for a period of five months until April 1, 1914, when the service ended its connection with the experiment.

The towns of Framingham, Wellesley, Needham, Weston, Belmont, Canton, and Winchester, and the city of Melrose, Mass, had united in placing during the above period their health work in charge of a central organization. The objects of the experiment were to determine the feasibility of such cooperation and at what cost small communities could secure efficient public health service. Exact accounts of all the expenditures incurred were kept for this purpose. There is now being prepared for publication a report on this experiment which it is believed will be of considerable value as a guide for efforts of a similar character.

NEED OF CONTINUED STUDIES OF SANITARY ORGANIZATION.

The analyses of health laws and regulations and studies of sanitary organization and administration already made indicate the value of this kind of work and need of its continuance. By reason of varying conditions to be met and lack of precedents in the past, the health organizations of States and local communities have been so developed as to differ much in character and methods of operation. While it may not as yet be practicable to draft model laws for adoption by all communities, effort should be made to strengthen local health organization and to encourage uniformity of administration.

Under our form of government the bulk of the sanitary work of the country must devolve upon State and local health organizations. The cooperation of the Public Health Service with them and their cooperation with each other are accordingly necessary, and there should be thorough knowledge on the part of all these agencies as to the authority and methods of operation of each. This can be accomplished by means of surveys and conferences authorized by law. In no better way can local health administration and appointment of all-time local health officers be encouraged.

These studies should be taken up on request of governors of States or the respective State health agencies. Requests from various States and one large city are now awaiting favorable action, and it is expected that officers will be assigned in due time to carry on the studies.

Recently enacted health laws and regulations are now being collected by another division and published currently in the Public Health Reports.

FULL-TIME COUNTY HEALTH OFFICER.

The movement for the full-time county health officer is progressing very satisfactorily and is destined to work an important change in the health conditions of rural districts.

In connection with this general movement there is evident a disposition on the part of health officers to form State associations which shall have annual meetings and at which the health officers can exchange views in regard to the policies, methods, results, etc.

In general it may be stated that the movement thus far is laying emphasis upon the instruction of the public in sanitary matters rather than upon the extreme police sanitary system. In other words, the spirit is that the full-time county health officer shall attempt to lead the people up to better sanitary conditions rather than to drive them into reforms.

Very naturally there has been in some localities opposition to the health officer's work, but there are already signs of a diminution in the opposition, due either to the diplomacy on the part of the health officers or to successful results that appeal to the public.

There is a certain belief that the success of a health officer is to be measured by the opposition he encounters, but while this interpretation is very tempting at times, this bureau would like to emphasize the point very strongly that one of the chief functions of a health officer is to unite the public in efforts along public health lines, and therefore one of the standards by which the health officer should be measured is his ability to overcome opposition diplomatically and to induce people of different frames of mind and different ideas to work harmoniously with the great purpose in view of reducing unnecessary sickness and unnecessary death.

LEPROSY INVESTIGATION STATION.

Work has been carried on both at Kalihi and at Kalawao, Hawaii, throughout the year. Although in this manner all of the pathological material that is obtainable at both places is secured there have been times when it was not possible to get what was urgently needed for the work. The large amount of pathological (post mortem) material that should be available at the Territorial Leper Settlement is all lost; indeed, so far as can be learned there has never been a post-mortem examination held there. Certainly there have been none within the past decade, and it does not seem possible to inaugurate this kind of work at present.

Late in May, at the request of the president of the Territorial board of health, the leprosy investigation station undertook the treatment of all patients who are admitted to the receiving station for lepers at Honolulu. This gives the laboratory at Kalihi a larger amount of clinical material than before and should be a material help in future work.

Surg. G. W. McCoy continued during the year as director of the station, and Mr. M. T. Clegg as assistant director. Since the last annual report the staff of the station has been decreased by the departure of the pharmacist and increased by the addition of an engineer. The acting assistant surgeon having developed pulmonary tuberculosis late in 1913, his place during his absence from duty was taken by a temporary acting assistant surgeon.

Laboratory studies.—Efforts to isolate acid-fast and other organisms from lepers and from cases of rat leprosy have been continued. Several acid-fast cultures have been isolated by Clegg's symbiant method, and by the method modified by Duval (omitting amœbas) and, also confirming Duval's work, without any added symbiant, contaminating organisms sufficing. Two of the new strains agglutinate with the blood of a single leper. These are the first cultures secured at the station that react in a significant manner with any leper blood.

In addition, several nonacid-fast cocco-bacilli that agglutinate occasionally with the blood of several lepers have been isolated. Two kinds of nonacid-fast branching organisms have been found in cultures made from leprous nodules. They are regarded as contaminations, but, strange to say, they have occurred only in the cultures that yielded acid-fasts as well. The fresh tissue-ascites fluid method has been tried with the view to growing organisms other than acid-fasts, but the results have been negative. The nonchromogenic acid-fast mentioned in the last annual report has been definitely eliminated as having any special relation to leprosy. Efforts have been made to get cultures of organisms isolated from lepers by other workers, especially those for which the most vigorous claims are made, but without success.

Animal inoculations.—So far as reproducing leprosy is concerned, the results have been entirely negative, though many of the experimental animals are still alive and under observation.

The year's work has emphasized the necessity of being on guard against confusing leprosy and tuberculosis in inoculated animals, a source of error that has led more than one worker astray. If one is familiar with tuberculosis in laboratory animals no difficulty will be experienced in differentiating them.

Immunity studies.—In the immunity work performed purely theoretical studies have been avoided and attention has been concentrated on those that appear to be of practical importance. A large number of agglutination, precipitin, and complement fixation tests have been made with the object of establishing the relations of various acid-fasts to each other and to the acid-fasts isolated from lepers and from rat leprosy. The results of different workers at the station are not wholly in accord, but in general it may be said that while there is but little difficulty in differentiating by biological methods the cultures from lepers from acid-fasts of other origin, the former exhibit little agreement among themselves.

Efforts at differentiating acid-fasts by the use of chloroform soluble and chloroform insoluble fractions of the organisms in the immunity tests gave negative results.

Complement deflection tests, using the extracts from lepromata against serum of lepers, show that a fairly high degree of specificity exists. It is interesting to note that the properties of the antigens do not bear any relation to their bacillary contents. In connection with these tests opportunity was taken to determine the complement content of leper blood, with the result that the amount of complement was found to be much the same as in normal blood.

The blood from a number of lepers has been studied in regard to the presence of acid-fast bacilli and the results indicate that sometimes even in cases in which there are no acute exacerbations the organisms may be found. This confirms the work done by others.

A number of official (medico-legal, etc.,) autopsies on Hawaiians have been attended at Honolulu with a view to discovering lesions of leprosy before outward manifestations of the disease appear. No case of early leprosy has thus been detected.

Further studies of the glandular lesions of lepers have confirmed the view that necrosis of lymph glands in these patients is nearly always due to the tubercle bacillus.

Thus far a virulent strain of rat leprosy has not been secured. It is believed that much could be learned if such a strain were available.

Statistical study.—The only work of this nature undertaken during the year was an analysis of the data available at the board of health offices concerning leprosy during the past 13 years. This supplements and brings up to date studies made by Dr. Brinckerhoff some years ago. While the results do not bring out any new points, they should not be without interest to students of the disease.

Clinical studies.—During the past year 28 cases of leprosy have been under treatment at the Kalihi Laboratory. Eighteen of these came under the care of the service late in the year. During the whole of the period patients have received no special treatment beyond large doses of chaulmoogra oil combined, in some cases, with strychnine. A few have been given chaulmoogra oil in the form of hypodermic injections, a mode of treatment that has been the subject of favorable report by Surg. Heiser, director of health of the Philippine Islands. Several patients at the Molokai Settlement have had the same treatment, one of them for a period of over a year. The results have been favorable in a general way, though there seems to be but little reason for expecting a definite cure in any of the cases. Certain complications of this mode of treatment may be mentioned here. The most serious of these is the development of deep necroses at the site of injection. This has occurred in three cases. While the abscesses have given but little inconvenience they have had a deterring influence on the popularity of the treatment. On three occasions patients began to cough severely immediately after the injection, and one suffered from marked but very temporary oppression of respiration and circulation. Two of the patients who suffered from the cough remarked that they could "feel the medicine taking effect all over the body." It is suspected that in these cases some of the oily injection fluid found its way directly into the circulating blood, although for the purpose of avoiding this accident the piston of the syringe is always withdrawn after inserting the needle to make sure that a blood vessel has not been punctured.

Carbon-dioxide snow.—Opportunity has been afforded to observe the use of carbon-dioxide snow in a number of cases. While the experience with this agent is too meager to justify any very definite statement as to its value, it seems likely that it is useful in the local treatment of the disease. We aré endeavoring to determine the influence of this agent on certain lesions, using others similar in size and location on the same patient as controls.

The most interesting case to come under observation during the year was one of very severe leprous fever, which proved fatal in about 10 days. The fever was accompanied by a rash, strongly resembling that of measles. In the patches of eruption and in the circulating blood numerous acid-fast bacilli were found.

Examinations of lepers.—Upon the request of the Territorial authorities two inmates of the settlement have been studied carefully, with a view to determine whether they now have leprosy. After several examinations one was declared clean; the other persistently showed a very small number of acid-fast bacilli in the nasal mucus, but no lesions were to be found in the nose nor were there any elsewhere. It was recommended that this case be paroled under the observation of the health department, the view being entertained that as this patient was constantly associating with lepers he might readily have a few acid fasts in the nasal cavities without actually being infected, or, indeed, the acid fasts might not be *B. lepræ* at all, as it is well known that a small percentage of healthy persons carry acid-fast bacilli in the nasal mucus.

Officers attached to the station have served on numerous official leper examining boards at Honolulu during the year, and the director was chairman of a special board convened by the president of the board of health at the station at Kalawao for the purpose of examining a large number of inmates of the settlement. Five of the persons who appeared for examination were pronounced nonlepers and four were reported as suffering from the disease in such form as not to constitute a danger to the community, and were therefore recommended for parole.

What disposal to make of lepers who have the disease in such a form as probably not to be a menace—pure nerve cases, without ulceration, cases in which the infection has become extinct but leaving such results as paralysis, atrophy, etc.—is one of the important practical problems in the handling of leprosy. Having in view conditions in Hawaii, the director believes that it is wise to parole such cases under the following conditions:

(1) The patient to report to a medical representative of the board of health for examination at least once in every three months.

(2) The patient should not be permitted to engage in any occupation that would necessitate his handling or preparing food for other persons.

(3) The patient should not live in the same house with children (16 years or under).

(4) The patient should have separate bedding and table utensils.

It is believed that an unnecessary hardship is inflicted upon the person, his family, and the community by keeping many cases, which so far as we know are harmless, in isolation. Perhaps one would be less inclined to take this view were it not known that a considerable number of cases of the nodular and mixed types of the disease are at large at all times. While it would be rash to make any comparison of the danger of cases of the different types of leprosy, it is believed that there are sufficient grounds for regarding the nodular and mixed cases as many times as dangerous to the community as the cases in which bacilli can not be demonstrated. Perhaps it would not be an exaggeration to say that one of the former is a greater menace to those about him than a dozen of the latter.

The experience of the director in the examination of numerous leprosy suspects at Honolulu and elsewhere in the islands convinces him that these persons should be examined at home by one skilled in the recognition of the disease. In this manner many cases that are now sent to Kalihi, examined by official boards and turn out negative, would not need to leave their homes, while many lepers would be detected much earlier than they are at the present time. More than one fully developed case has been seen in which the history showed that the disease should have been detected, not merely suspected, months or years earlier. The health department should have at its disposal a diagnostician who could be sent anywhere in the Territory for the purpose of seeing any suspected persons with the attending physician, and on the report of this expert would rest the matter of submitting the case to official examination.

Hygienic Laboratory.

The scope of the work of the Hygienic Laboratory has increased in proportion to the development of the public health activities of the service in accordance with recent legislation.

An account of the routine work and present needs of the laboratory will be found below. Reference to more important investigations and special work conducted in part either at the laboratory or under officers connected with the laboratory will be found under the following headings: Potomac River, Coastal waters, Sewage disposal, Waste disposal, Industrial sanitation, Tuberculosis, Pellagra, Rocky Mountain spotted fever, Hookworm disease, School sanitation, Diphtheria, Contamination of food, Viruses, Serums, etc.

Personnel.—The personnel attached to the Hygienic Laboratory at the end of the fiscal year consisted of 1 director, 1 assistant director, professor of zoology, professor of pharmacology, professor of chemistry, 20 medical officers, 2 pharmacists, 1 sanitary chemist, 7 technical assistants, 1 artist, and 35 attendants. This personnel of 71 is an increase of 10 over the total number attached to the laboratory 12 months ago.

In addition, there were 21 employees engaged on field investigations of public health matters conducted under the various divisions of the laboratory. These employees were classed as follows: 2 sanitary engineers, 4 sanitary chemists, 3 sanitary bacteriologists, 2 special experts, 1 temporary stenographer and typewriter, 1 pilot, 1 engineer, and 14 attendants.

Course of instruction.—Beginning January 1, 1914, a class of six student officers reported at the laboratory for a course of instruction.

The course was similar to that given in previous years, with the exception that it was considerably broader in the scope of subjects studied. In addition to the course in pathology and bacteriology, representatives of the divisions of zoology, pharmacology, and chemistry gave instruction in special subjects. A series of some 20 lectures were also given the class by various representative persons, mostly officers of the service. It is believed that this latter feature, which was adopted for the first time, should be amplified for future classes so their members will have the benefit of a large number of lectures by experts.

Lectures for State and local health officers.—It is intended to extend the privileges of the course of lectures during the next fiscal year to representatives of State, municipal, and county boards of health. On account of the limited space it does not seem feasible to offer at the same time the course of instruction in laboratory methods to such representatives, but it is believed that the course of lectures covering three or four weeks, beginning about February 1, can be so arranged as to be of the greatest benefit to these health officers.

Library.—The library of the Hygienic Laboratory now contains approximately 3,500 books and something over 2,000 reprints. In addition there are received approximately 70 technical journals of various kinds, many of these being weekly publications. These journals are printed in several languages other than English, and the services of a properly trained librarian, with a knowledge of certain foreign languages, would be of the greatest value in the conduct of the work of the laboratory. On account of the growth of the library the present library room is beginning to be crowded, and it is only a question of a short time when additional library facilities will have to be provided for.

Buildings and grounds.—Congress authorized, by an appropriation of $25,000, the construction of an animal house, carpenter shop, and disinfecting room. The plans for this building have been drawn by the Supervising Architect, proposals invited, and the contract entered into for constructing the building. At the close of the fiscal year the actual construction of the building had been begun. In addition proposals had been asked by the Supervising Architect for grading the grounds of the laboratory.

This work (construction of the building and grading of the grounds) will result in great improvement in the present unsightly condition of the laboratory grounds, which are in sad contrast with those of the naval reservation adjoining. As soon as the animal house is completed the present frame buildings will be removed, thus eliminating a very unsightly condition as well as removing the danger of fire.

Branch laboratory at Ellis Island.—Many of the investigations desired to be undertaken at the Hygienic Laboratory have been hampered by the lack of clinical facilities and material, such, for example, as the studies on scarlet fever and other infectious diseases. Some consideration has been given to the establishment of some system of cooperation between the Hygienic Laboratory and the laboratory at Ellis Island. For administrative purposes it would facilitate the studies greatly if the laboratory at Ellis Island could be made a branch of the Hygienic Laboratory.

During the coming winter it is desired to take up studies of a number of infectious diseases, and it will be necessary, in the conduct of those investigations, to have clinical facilities and material. It is expected, therefore, to enter into some kind of an arrangement with the Ellis Island hospital and laboratory for this purpose.

Examinations for tuberculosis.—In accordance with provision in Executive order of December 7, 1905, 19 employees of various branches of the Federal Government, located in the city of Washington, were examined to determine whether they were suffering from tuberculosis. Of this number, 12 were found to be suffering from the disease, 4 showed negative findings, and 3 were doubtful. In each instance where an employee was found to be suffering from tuberculosis, advice was given to the employee, and the administrative officer informed of the findings with a view to safeguarding the health of other employees in the same office.

Aid to other branches of the Government.—During the year a large number of specimens of water were examined at the request of the health officer of the District of Columbia and reports made thereon. These specimens consisted chiefly of samples of water taken from the water supply of schools in the District.

At the request of the health officer, the director of the laboratory appeared in court on two occasions to give testimony in connection with the prosecution of certain dealers for selling filthy milk.

A large amount of assistance has been rendered by various members of the laboratory staff to the Civil Service Commission in preparing examinations and grading papers of applicants for technical places in the Government.

On request of the insecticide board of the Department of Agriculture, a number of disinfectants have been examined and reports made thereon, as well as advice given the board in regard to the prosecution of certain cases in court.

At the request of the administrative officers of various bureaus, a considerable number of Government employees have been given the antityphoid prophylactic. It is hoped that a larger number of Government employees will avail themselves of this privilege.

Technical advice has been given, both verbally and written, to different branches of the Government at their request.

Under instructions from the bureau, representatives of the laboratory aided in vaccinating a considerable number of Government employees.

Sterilization of dental instruments.—At the request of representatives of the dental profession a study was begun late in the fiscal year as to the best methods applicable to the sterilization of dental instruments. This is a subject of much public-health importance, as undoubtedly at times certain diseases may be transmitted from patient to patient by the use of improperly cleaned and inefficiently sterilized dental instruments. The studies have barely been begun and sufficient time has therefore not passed to permit of any of the results being reported.

Aid to revision committee of the Pharmacopœia.—The cooperation and assistance of representatives of the Hygienic Laboratory in the ninth revision of the Pharmacopœia have been continued. In the fiscal year 1914 the director of the laboratory prepared for the revision committee a chapter on diagnostic reagents and tests, and in addition has passed upon material relating to the inclusion of various biological products in the pharmacopœia.

The question of the inclusion of some form of tablets of bichloride of mercury has been referred to the director of the laboratory for the formulation of a plan for the revision committee, and the method provided for in the German Pharmacopœia was recommended for adoption in the United States Pharmacopœia.

DIVISION OF PATHOLOGY AND BACTERIOLOGY.

Much of the work done under this division will be found described under separate headings.[1]

Pathological specimens.—During the year 25 specimens of blood were received at the laboratory for examination for various purposes other than the Wassermann reaction, and 448 specimens were received from service stations for the application of the Wassermann reaction or some modification of the same. There were 49 specimens of feces received for examination, of which number 6 were found to be positive for typhoid or paratyphoid. Four specimens of sputum were received from service stations, 24 specimens of tissues, 24 of urine, and 253 of water. Arranged according to the diagnosis, these specimens were as follows:

Malaria:		
Blood smears—		
Positive	2	
Negative	3	
	—	5
Typhoid and paratyphoid:		
Feces—		
Positive	6	
Negative	32	
No report	2	
Urine—		
Positive	0	
Negative	13	
Blood cultures—		
Positive	1	
Negative	4	
Blood for Widal—		
Positive	9	
Negative	3	
	—	70
Tuberculosis:		
Sputa, negative		4
Malta fever:		
Agglutiuation test, negative		2
Hookworm and other parasites:		
Feces—		
Positive	1	
Negative	8	
	—	9
Diagnostic work:		
Urines	11	
Tissues	24	
Blood counts	5	
	—	40
Water, ice, and sewage, for general bacteria content		253
Total		383

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[1] See Water on common carriers, Tuberculosis stndies, Viruses, serums, etc.

Crotalin.—A number of inquiries have been received at the Hygienic Laboratory in regard to the value of solutions of crotalin (rattlesnake venom) in the treatment of epilepsy and other conditions, and as information had been received of the death of a patient due to contamination in solutions used for the treatment of epilepsy, a study was made by Surg. John F. Anderson on solutions of crotalin as found on the open market. Of the samples found on the open market and examined in the Hygienic Laboratory 38.8 per cent were found to be contaminated, many of them with an anaerobic gas-forming bacillus similar to that found in the fatal case.

A paper has been published in a medical journal giving the results of these studies. In this paper the difficulties in the way of the preparation of a satisfactory sterile solution were pointed out, as well as the dangers from the use of solutions of this material. From all the evidence available, it does not seem that solutions of crotalin are of any permanent value in the treatment of epilepsy and other conditions for which it has been recommended.

Cholera media.—The studies begun during the previous fiscal year by Surg. Goldberger upon a selective medium for cholera were completed and the results included in an article in bulletin 91 of the Hygienic Laboratory series. As a result of his studies, Dr. Goldberger was able to recommend a formula for a selective medium for cholera which seemed to possess decided advantages over any other medium used for the same purpose.

Rocky Mountain spotted fever.—Surg. Fricks devoted a considerable portion of his time during the late fall and winter while attached to the laboratory to studies upon Rocky Mountain spotted fever, with a special view to cultivating the causative organism. A large number of cultures were made, using both the ordinary technique and media as well as special methods and media. All of these, however, resulted negatively.

In addition, Dr. Fricks prepared for publication certain articles on spotted fever, including unpublished notes of the late Passed Asst. Surg. McClintic.

Poliomyelitis.—Following the report by Prof. Rosenau, of Harvard University, on the possible rôle of the Stomoxys calcitrans in the transmission of poliomyelitis, similar studies were made at the Hygienic Laboratory in the latter part of 1912. These studies confirmed in a way the report of Prof. Rosenau. Later work of other investigators having reported negative results, it was decided to repeat the experiments of the previous year at the laboratory. In spite of a large number of experiments, duplicating in every particular the experiments of the preceding year, the investigators were unable to infect monkeys with poliomyelitis by the bite of the stable fly. The reason for these negative results is not apparent, and the matter is continuing to receive the attention of the laboratory.

The reported cultivation by representatives of the Rockefeller Institute of the organism of poliomyelitis has stimulated work along these lines; but no attempts have been made at the Hygienic Laboratory to confirm the results. So far as known, cultivation of the organism has not been confirmed by others.

Tetanus in vaccine virus.—Studies on the relation of vaccine virus to tetanus by Surg. Edward Francis, begun in the previous fiscal year, were completed. His results have been prepared for publication as

Bulletin 95 of the Hygienic Laboratory series. It is believed that his results will undoubtedly be of much value in overcoming the alarm in certain quarters as to the danger of contracting tetanus from vaccination.

One important feature of the work was an attempt to produce tetanus in monkeys by virus artificially contaminated with tetanus spores. In every instance the experiment resulted negatively, thus showing the difficulty, if not the impossibility, of producing tetanus by vaccination with material known to be contaminated with tetanus spores.

One case of tetanus was reported during the year at Kansas City, Mo., and one at Danville, Ky., but in each case the most painstaking investigations and laboratory examinations failed to disclose any relation to the vaccine virus used. It was apparent that the introduction of the tetanus organism had in both cases taken place subsequent to vaccination, owing probably to lack of care of the wound. These fatalities confirm the opinion previously expressed by the bureau that the use of a vaccination shield in the absence of certain, frequent, and careful attention of the wound is to be condemned.

Antimeningitis serum.—Studies at the Hygienic Laboratory looking to the formulation of a standard for the measurement of the potency of antimeningitis serum have also been begun. These studies have not yet been completed, and will be continued during the coming fiscal year.

In regard to a standard for antimeningitis serum, studies of a satisfactory preservative for antimeningitis serum and other sera used for intraspinal or intracranial injection were made by the divisions of pathology and bacteriology and pharmacology in cooperation. The studies showed that serum containing trikresol or phenol possessed an unusual toxicity when given intraspinally which was not apparent in sera not containing these preservatives. Studies are being continued with a view to securing a satisfactory substitute, as a preservative, for trikresol and phenol to be used in serum for intracranial or intraspinal use.

Distribution of antirabic virus.—The number of patients treated at the Hygienic Laboratory for the prevention of rabies during the fiscal year was greater than for any other year since the treatment was begun. During the year 134 persons were treated, as compared with 118 for the preceding fiscal year.

There occurred one death from rabies in a person who had just completed the course of treatment at the laboratory. This makes the second death from rabies among the 657 patients treated at the laboratory since the inauguration of the treatment, April 28, 1908. The two deaths among that number give a percentage of 0.3, which is lower than the average recorded at similar institutions.

In addition to the death from rabies during the fiscal year just closed there occurred a death from so-called "treatment paralysis" developing during the course of the treatment. While there had previously occurred two cases of treatment paralysis in persons treated at the laboratory, both recovered. The cause of treatment paralysis is a question that has received the attention of the laboratory, but as it was impossible to obtain an autopsy on the fatal case no studies could be made to determine whether it was a case of modified rabies or really a case of ascending paralysis.

During the year 1,541 complete treatments were sent out from the laboratory on request, as follows:

	Treatments.
Alabama	345
Arkansas	25
Canal Zone	13
Colorado	11
Cuba	1
Delaware	22
Iowa	39
Illinois	147
Indiana	199
Kansas	48
Kentucky	95
Maryland	3
Massachusetts	1
Missouri	1
New York	1
North Carolina	207
North Dakota	1
Oregon	19
Tennessee	101
Texas	3
Vermont	1
Virginia	96
Wisconsin	5
Washington	157
Total	1, 541

This number of 1,541 treatments is higher than that sent out in any other previous fiscal year, the number for the preceding fiscal year having been only 1,353.

Studies on rabies.—During the year the heads of 108 animals were received at the Hygienic Laboratory for examination to determine whether the animals were suffering with rabies. Of this number a positive diagnosis of rabies was made in 56, a negative diagnosis in 46, and 6 were not in a condition for examination.

The question of the modification of the virus prepared at the laboratory has received consideration, and toward the close of the fiscal year studies in regard to the efficacy of certain methods of treatment were begun by Passed Asst. Surg. H. E. Hasseltine. It is proposed in this study to investigate the relative value of certain methods of preparing the virus as compared with methods at present in use at the laboratory. This study has special reference to the value of dried virus prepared by Dr. Harris, of St. Louis. If the Harris modification is found to be superior to other methods it will result in a great saving of labor at the Hygienic Laboratory and a virus of higher potency. These studies will not be completed for some months.

Antityphoid prophylactic.—During the year the amount of antityphoid prophylactic prepared at the Hygienic Laboratory was greatly increased over that of the previous year. This was due to several reasons, one of which was that the bureau had instructed officers of the service at the marine hospitals to offer the typhoid prophylactic to beneficiaries of the service. Moreover, a number of employees of the Federal Government located in Washington applied for the prophylactic. During the year 774 inoculations were made at the Hygienic Laboratory of such persons, and 4,118 1-cc. ampules of vaccine were sent from the laboratory.

Milk studies.—It is to be regretted that during the year it was impossible to increase the number of babies to whom the benefits of the milk station at the Hygienic Laboratory were extended. Repeated efforts were made to obtain the cooperation of certain institutions in Washington in order that the studies of the relative value of raw and pasteurized milk might be enlarged, but these efforts were unsuccessful.

During the year a total of 49 babies received the benefits of the station, 17 of whom were carried over from the previous year and 32 were new applicants; 29 were discontinued for various reasons, and at the end of the fiscal year there were 20 remaining. The results so far obtained have not as yet been of sufficient definiteness to warrant anything other than a progress report.

Disinfectants.—On request of the insecticide board of the Department of Agriculture, samples of disinfectants were examined during the year in the Hygienic Laboratory in accordance with the Hygienic Laboratory method for determination of the phenol coefficient of coal-tar disinfectants.

In addition, a number of samples were examined for the General Supply Committee in connection with the awarding of contracts for supplying disinfectants to the Federal departments.

Use of the Hygienic Laboratory method has continued to be eminently satisfactory, and it is gratifying to note that it is coming into more and more general use throughout the United States.

Water standards.—During the fiscal year a commission on water standards was appointed by the Secretary of the Treasury, the director of the Hygienic Laboratory being made chairman. After a great amount of correspondence, this commission arrived at certain tentative standards, which were approved by all except two of its members. The report of the commission recommending certain standards, which had received the approval of all but the two members, was submitted to the bureau for its consideration.

The necessity for such standards appears evident, and it is to be hoped that it will be possible soon to arrive at a unanimous report by the commission and that the standards so recommended may be promulgated.

DIVISION OF ZOOLOGY.[1]

International Commission of Zoological Nomenclature.—Cooperation with the Internationl Commission on Zoological Nomenclature, referred to in a number of preceding reports, has been continued, Prof. Stiles serving as secretary of the commission.

This last year the International Zoological Congress authorized an important innovation in connection with the scientific names. Heretofore the International Code on Nomenclature has been the only basis upon which the commission worked. In the Berlin congress some of the members of the commission wished to recognize certain exceptions in the code, but they were outvoted and the commission was instructed to apply the code rigorously. It was not difficult to foresee that a consistent application of the code would sooner or later produce widespread discontent in certain cases, and would result in a desire on the part of many scientific men to adopt exceptions, such as were proposed by the president and the secretary of the commision. The discontent in question developed, and as a result the international congress authorized the commission to decide special cases under a plenary authority given to the commission to suspend the code under certain circumstances. It remains to be seen what success will follow this departure, but all indications at present are that greater harmony will exist in respect to scientific names.

The last report of the Internationl Commisison on Zoological Nomenclature will be found in Science, July 4, 1913, pages 6 to 19, and the revised International Code can be found on pages 895 to 900, of the proceedings of the IX^E Congrès International de Zoologie tenu à Monaco (issued in 1914, Rennes, Imprimerie Oberthür).

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[1] See also Hookworm disease, Contamination of foods, Medical inspection of school children.

Index Catalogue of Medical and Veterinary Zoology.—On account of the fact that the Division of Zoology has been engaged chiefly in field work, very little progress has been made in the laboratory this past year in connection with this catalogue, but the Bureau of Animal Industry has been continuing its portion of the work.

Determination of zoological specimens.—As a knowledge of parasites and parasitic diseases increases in this country and as the State boards of health become more and more accustomed to determining specimens, there is a decrease in the number of the more common parasites sent in for study, but the Division of Zoology still continues to receive for determination specimens of the rarer sort.

DIVISION OF PHARMACOLOGY.

Personnel.—Prof. Reid Hunt resigned as chief of the division on October 23, 1913, in order to accept the position of professor of pharmacology at the Harvard Medical School. Prof. Carl Voegtlin, of Johns Hopkins University, was appointed as his successor. Prof. Voegtlin took charge of the division on October 23, 1913, having been connected with the Public Health Service since October 1, 1913, as special expert.

Several other changes were made in the personnel during the fiscal year, the force employed consisting at the end of the year of eight technical assistants and special experts in addition to the chief of the division. With this increased personnel and the wider scope of the work the available quarters are now inadequate.

Standardization of drugs.—Work on the chemical standardization of such drugs as thyroid and adrenal has been continued. The marked seasonal variations in the iodine content of the thyroid preparations demonstrated previously were confirmed by analyses of samples collected biweekly during the year. This variation in the active constituent of the drug has led the committee on the revision of the United States Pharmacopœia to consider very strongly the adoption of an iodine standard for this drug, and such a standard will be adopted in all probability. The epinephrine content of the adrenal gland does not exhibit such seasonal variations.

The many therapeutic applications of pituitary preparations made the standardization of this drug an important subject for investigation. A new standard for this work was devised, by means of which it was found that the commercial preparations of pituitary extract vary greatly in strength. It is certainly very desirable for physicians to be supplied with preparations of constant strength of this potent drug, as many of the instances of untoward symptoms appearing after the administration of pituitary preparations to patients may be attributed to a lack of accurate dosage.

Preservatives for antimeningitis serum.—Two publications from this division deal with the toxic effect of certain phenol preservatives used in the manufacture of antimeningitis serum. It was established beyond doubt that trikresol and phenol are undesirable preservatives and that their addition to antimeningitis serum may in some cases lead to grave symptoms and even death of the patients treated by means of this serum. Chloroform was suggested as a substitute for the phenols, as it was found that this preservative did not exhibit any marked toxicity in animals in the quantities which are necessary for the preservation of serum.

Examination of poisonous gases in tunnel air.—An investigation into the nature and quantities of poisonous gases in the air of some railroad tunnels in Baltimore, Md., revealed the fact that considerable amounts of carbon monoxide and sulphur dioxide are present. The quantities found are, however, not sufficient to cause any poisoning of passengers on trains passing through these tunnels. In the case of workingmen employed in making repairs on the tunnel the possibility of a harmful effect caused by these gases must, however, be kept in mind. In connection with this research the methods for the estimation of small amounts of sulphur dioxide and carbon monoxide were greatly improved, a fact which will doubtless be of value to workers in industrial hygiene, as these gases occur in certain factories and mines in considerable quantities.

Pellagra.—Work was begun on the etiology of pellagra. The division has taken up in particular the relation of diet to this disease. For this purpose extensive feeding experiments were carried on on various species of animals with a view of ascertaining the effect of an exclusive vegetable diet. It was found that certain animals die if kept for some time on such a diet. Toxic symptoms arise and autopsy reveals constant lesions, referring to a toxic constituent in the diet. On analysis these vegetable foods showed a relatively high content of soluble aluminum compounds. As aluminum compounds are poisonous to animals when administered in sufficiently large amounts, the question of an injurious effect of such vegetable food is open to experimentation. The pharmacological aspects of this question are under investigation. In connection with the experimental work on this subject a field hospital for the study of pellagra was recently opened. It is proposed to apply there the laboratory findings to the study of human cases. The question of the effect of a mainly vegetable diet on man has never been studied from a broad point of view. Only isolated cereals (rice in its relation to beriberi) have received some attention by investigators. The experiments now in progress are therefore fundamental, not only in their relation to pellagra, but also in their bearing on our theories of nutrition in health and disease. Many practical advances can be expected from this work.

Digests of Comments on the Pharmacopœia of the United States and on the National Formulary.—The preparation of the material for the Digests of Comments has been continued, and during the year Hygienic Laboratory Bulletin No. 87 was printed and distributed and Hygienic Laboratory Bulletin No. 93, embodying a digest of comments for the calendar year ending December 31, 1912, was compiled and published. The material for still a further Bulletin embracing a digest of the comments which appeared during the calendar year ending December 31, 1913, is about ready for compilation, thus bringing this series of bulletins practically up to date. This latter fact will make the Digest even more useful than in the past, as it will contain the most recent literature pertaining to the Pharmacopœia. As in former years this bulletin was received by the profession interested in the pharmacopœias of the various countries with great appreciation.

Digest of Laws and Regulations Relating to the Possession, Manufacture, Sale, and Use of Poisons and Habit-forming Drugs.—In compliance with requests made by several organizations interested, a digest of laws and regulations enacted during the year 1912–13 was compiled and published in the Public Health Reports for October 10 and 17, 1913. This material was subsequently issued as Reprint No. 146 from the Public Health Reports, and in this form has attracted considerable attention, being frequently quoted in arguments for greater uniformity in the several State laws relating to the possession, use, and sale of poisons and habit-forming drugs. Because of the newspaper notoriety given to several cases of poisoning by tablets of corrosive mercuric chloride, a number of bills were introduced in Congress and also in various State legislatures in session during the year to restrict the sale of tablets of mercuric chloride to preparations having a distinctive form or color. An article on the subject was prepared and subsequently published in Public Health Reports for November 14, 1913. This article attracted considerable attention and has been reprinted and commented on favorably in the medical as well as pharmaceutical journals, and the data contained therein have been freely quoted to counteract the agitation for special legislation to affect this particular poison. Up to the present time none of the bills introduced have been enacted into law. While it is generally conceded that the number of cases of poisoning could be materially reduced if existing laws were uniformly and strictly enforced, the popular demand appears to be for more legislation rather than the enforcement of existing legislation, and considerable educational work must be done to point out the need for providing adequate funds and machinery to enforce laws already on the statute books and to have objectionable or ineffective laws repealed, so as adequately to safeguard human lives by regulating the sale of poisons and restricting the distribution of potent and narcotic drugs to legitimate uses. The need for greater consistency in the enforcement of laws was also emphasized, in a paper prepared by one of the members of the division, published in Public Health Reports for May 8, 1914, entitled "Pure Drugs and Public Health."

Narcotic drugs.—Considerable interest is being evidenced in the subject of legislation to restrict the sale and use of narcotic and habit-forming drugs, and many inquiries have been received for information regarding available data as to the number of cases of drug addiction and the amount of drugs used. Several States have enacted stringent antinarcotic legislation and in Tennessee, under the recently enacted antinarcotic law, a compilation has been made of the number of drug addicts in that State. The figures available at the present time indicate that the estimates as to the number of drug habitues in the United States have been generally somewhat high, and that, based on the average consumption of morphine by drug addicts in Tennessee, the total number of morphine and opium habitues in the United States does not exceed 140,000, while the number of habitual users of coca or cocaine is probably very much lower. The National Drug Trades Conference, consisting of representatives from the several national drug and pharmaceutical associations, has had several meetings in the city of Washington which were attended by one of the members of the division. The members of this conference have unanimously indorsed the pending Harrison antinarcotic act which was passed by the House of Representatives June 26, 1913. This bill has been favorably reported upon by the Committee on Finance and is now before the Senate. If enacted into law, it would serve to supply the necessary information to make the several States antinarcotic laws effective, and would effectually overcome the heretofore made objection that the enforcement of State laws simply tends to increase illegal traffic in the drugs from without the State.

A review of the literature relating to the use of paraffin oil as a laxative has been published in the pharmaceutical journals and is now being used as the basis for experimental observations as to the possible utility of this drug to assist in overcoming chronic constipation.

United States Pharmacopœia revision.—Considerable work has been done by members of the division in connection with the revision of the Pharmacopœia of the United States and the National Formulary, also in connection with the work of the committee on unofficial standards for drugs and medicines of the American Pharmaceutical Association. The revision of the National Formulary is practically completed, but the book is to be published simultaneously with the Pharmacopœia of the United States and, therefore, the manuscript has not as yet gone to press. The work of revising the Pharmacopœia of the United States is well under way, and up to the present time three installments of proposed changes have been published in the pharmaceutical journals of the country and in the form of separate pamphlets. One of the members of the division is a member of the council on pharmacy and chemistry of the American Medical Association, which is making efforts to correct some of the many abuses existing at the present time in connection with drug therapy. The revised edition of the book on efficient remedies entitled "Useful Drugs" has been published by the council and adopted as the basis for instruction by many of the leading medical schools, and as a basis for examination by a number of State examining and licensing boards. This publication has attracted considerable attention abroad and it is expected that in time it may be developed as a basis for uniform requirements in connection with an international list of useful and widely used drugs.

The publication of the council on pharmacy and chemistry of the American Medical Association entitled "New and Non-Official Remedies" is now undergoing thorough revision, and the information given in future editions of the book will undoubtedly be of greater value to the practicing physician because of its being more critical in form than is the information contained in the book at the present time.

Examination of drugs, miscellaneous analyses.—Several hundred samples of various kinds were analyzed or examined. These included about 100 samples of drugs received from the purveying depot to determine whether they conformed to the pharmacopœia standards; various antitoxins; a sample of toxic weed from New Mexico; certain alleged remedies for pellagra; samples of neosalvarsan which were supposed to have caused the death of seven patients in a hospital in Los Angeles, Cal., etc.

Aid to other departments of the Government.—Memoranda have been prepared for the Bureau of Internal Revenue as to whether certain alcohol-containing preparations could properly be regarded as bona fide medicines.

DIVISION OF CHEMISTRY.[1]

Personnel.—At the end of the fiscal year the Division of Chemistry and its personnel were in charge of Prof. E. B. Phelps, appointed chief of division October 1, 1913, Prof. E. C. Franklin having resigned.

The work of the division has been organized into three groups, namely, laboratory investigations and analyses, industrial waste investigations, and sewage-disposal investigations, in charge of Sanitary Chemist A. F. Stevenson, Sanitary Chemist H. B. Hommon, and Sanitary Engineer L. C. Frank, respectively.

Rubber nipples.—Attention having been directed to the possibility of danger in the use of certain heavy metals in the manufacture of rubber nipples and toys, the examination of 17 articles of this kind was undertaken. The only harmful ingredient detected was antimony, which is used quite commonly in red rubber goods. The study of the solubility of antimony salts from red rubber compounds showed that under actual conditions a sufficient amount of antimony could be extracted from a new nipple to injuriously affect a young infant.

Disinfectants.—Investigations have been made looking toward a cheap and efficient disinfectant, the formula for which could be made available for general use. Many classes of commercial materials have been examined and the results thus far obtained give assurances of a satisfactory solution. This work is still incomplete.

Phosphorus in matches.—In connection with the enforcement of the Federal laws relative to the use of white or yellow phosphorus in matches, investigations of the methods for the detection of white or yellow phosphorus in the presence of other permissible forms of phosphorus such as the red amorphous and sesquisulphide have been undertaken. As a result of this study a new method has been devised which is rapid and simple and exceedingly sensitive.

Routine examinations of some 39 samples of matches and match materials have been made for the information of the Commissioner of Internal Revenue.

Dissolved oxygen in water.—The importance of the determination of dissolved oxygen in water in connection with stream investigations and the inaccuracies of the present standard method of procedure has made it necessary to investigate new methods for carrying out this determination. Extensive study of the entire matter has therefore been made and a satisfactory modification of the existing method has been found. This modification had previously been described but had not been generally recognized in this country. In connection with this investigation it also became necessary to determine the dissolved gases in water by an absolute gasometric method. A simplified modification of existing gasometric methods has been developed, which is capable of a high degree of accuracy and is at the same time simple and rapid.

Heat dissipation from human body.—Studies have been made at the Institute of Technology, at Boston, and in cooperation with the New York State ventilation commission, upon certain physical factors which influence the dissipation of heat from the human body. These studies have been under the general direction of the chief of the division, and are now completed and are being prepared for publication. In this same connection studies have been made at Washington upon a suitable instrument for the recording of the actual condition of the atmospheric environment as it relates to heat dissipation from the human body. This condition is a complex function of humidity, temperature, and air movement, and the instrument in question, called the comfortimeter, has for its object the proper balancing of these factors and the recording of a single index of comfort. Work upon this instrument is not yet complete.

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[1] See also Industrial Wastes; Sewage Disposal, Railroad Sanitation; Wilmington Water Supply; Cooperative Health Work in Massachusetts.

Milk and water analyses.—In connection with infant-feeding experiments about 600 determinations of fat in milk have been made during the year. Approximately 2,300 analyses of water have been made in connection with the investigation of the Potomac River. The greater part of this work comprised the determination of dissolved oxygen. Standard solutions have been prepared for the Potomac River investigation, for use on board the steamer *Bratton* and at the Colonial Beach laboratory. Solutions have also been supplied to the various laboratories on the Ohio River, the plan having been adopted of sending out "master solutions" for all this work, so that the results might be strictly comparable.

Drug analyses.—Six specimens of drugs have been examined for compliance with the requirements of the United States Pharmacopœia. In connection with studies on industrial hygiene, examinations have been made of certain materials, notably of a specimen of partine, a powder used in brass foundries, and a specimen of zinc upon which garment workers cut their cloth. It was desired to learn if the former contained any arsenic or other deleterious substance, and if the latter contained lead, which might be breathed by the operatives.

Dyestuffs.—A comparative study of various dyestuffs was made, in order to determine which commercial dye possessed the greatest coloring power relative to its cost. It was decided to use a considerable quantity of some such dyestuff in the detection of privy pollution of wells. The most powerful substance found was the dyestuff "fluorescene."

Milk tests.—Some determinations have been undertaken to determine, if possible, the age and cleanliness of milk by purely chemical means. Special tests for excrement and for putrefactive changes taking place normally in milk have been studied in some detail. This work is still incomplete.

Ultra-violet sterilization apparatus in Capitol.—In compliance with a request received from the Superintendent of the United States Capitol Building and Grounds, Washington, D. C., a test was made on March 10, 1914, at the Hygienic Laboratory of an ultra-violet ray apparatus for water sterilization installed at the Capitol for purposes of demonstration.

In this test the Washington City water was used. Before treatment the water showed 7 bacteria per cubic centimeter with *B. coli* absent in 10 c. c. After being subjected to the action of the rays for a period of 10 seconds the water showed no growth of any kind in quantities as large as 20 c. c.

It was suggested, however, to the superintendent that the water supply of the city of Washington being of excellent quality it requires no further sterilization to make it safe. If by any chance the efficiency of the city filters should be impaired, any increase in the bacterial content would be accompanied by a corresponding high increase of turbidity. This would prevent the satisfactory operation of an ultra-violet ray machine, since experience has demonstrated that for satisfactory treatment with this type of apparatus the water must be absolutely clear.

Tests of air in Capitol.—At the request of the superintendent of the Capitol also an investigation was made in April, 1914, of the ventilation and air in and about the Senate Chamber and the Hall of the House of Representatives, United States Capitol.

After inspecting the provisions for ventilation 19 samples of air were collected and examined. The observations made referred to the temperature, relative humidity, number of bacteria capable of growing on nutrient gelatin at 20° C. and on nutrient agar at 37° C., number capable of producing an acid fermentation in lactose at 37° C., and number of dust particles per cubic foot of air.

The bacteria and dust contents were found to be normal to pure air, as could be expected from the large volume of air furnished and its source. The temperature of the air entering the Senate Chamber was found to be from 74° to 77.5°. The air in the House of Representatives Hall ranged about 71° for the incoming air and from 75.5° to 77° for exhaust air. In the Senate Chamber the relative humidity of the incoming air was from 29 to 33 per cent, and that of exhaust air from 20 to 29 per cent. On the House side the incoming air had a humidity of from 33 to 51 per cent, and the exhaust air from 26 to 32 per cent. The lower (relative) humidity of the exhaust air in both cases was in part due to the higher temperature and probably also to the addition of drier air from the heated corridors.

It was suggested to the superintendent that a temperature of not over 70° in the incoming air, with a relative humidity of approximately 40 per cent, would provide conditions of much greater comfort than those then maintained, especially in the Senate Chamber. It was also suggested that provision for humidifying the air supply by means of automatic apparatus and control of both temperature and humidity by self-recording thermographs and hygrographs would greatly simplify the system in operation, make conditions much more uniform and satisfactory, and furnish a permanent record of the conditions maintained. The opening of the corridor doors for the purpose of cooling the chambers was discouraged, since under these variable conditions it became impossible to control the heating and ventilating systems in use.

Weekly conference.—The plan of a weekly division conference has been inaugurated with good results. Various members of the staff present each in turn before the conference a report upon the particular problems upon which they are engaged, with special reference to difficulties and uncertainties which have arisen. These matters are freely discussed by the members of the conference, and much valuable assistance has been given to the various members of the staff through the medium of these discussions.

VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS.

In the administration of the act of July 1, 1902, regulating the sale of viruses, serums, etc., 38 establishments were inspected, 27 licenses were renewed, and 10 new licenses and 4 supplemental licenses were issued. Six licenses were either forfeited through closure of the establishment or revoked on account of noncompliance with the provisions of the law.

A list of the 41 establishments (26 American and 15 foreign) holding licenses at the end of the fiscal year was published in the Public Health Reports of July 10, 1914.

During the year a total of 1,113 samples of viruses, serums, toxins, and analogous products were examined by Passed Asst. Surg. J. P. Leake at the hygienic laboratory, in connection with the enforcement of the act approved July 1, 1902. In addition to the examination of these samples Dr. Leake has prepared and tested for distribution at bimonthly intervals the standard diphtheria unit, as well as testing the standard unit for tetanus antitoxin.

Violation of law.—On the receipt of information that a St. Louis, Mo., concern was selling so-called Piorkowski tuberculin in violation of the law, evidence to this effect was immediately collected through officers of the service and brought to the attention of the law officers of the Government. Steps were accordingly taken by the latter to prosecute the offending parties before the courts. This prosecution is now pending.

INVESTIGATIONS OF POLLUTION OF WATERS.

In undertaking investigations of navigable waters authorized by the act of Congress of August 14, 1912, selection was made of three types of waters that should be first studied to secure data of general application. These include the Ohio and Potomac Rivers and coastal waters along the Atlantic and Gulf seaboards. On the watersheds of the navigable waters referred to are presented those fundamental problems in respect to conservation of sanitary resources, the solution of which will be of great economic as well as sanitary value. For instance, the Ohio River watershed comprises an area of over 200,000 square miles, the waters are fresh, and serve not only as sources of potable supplies, but receive the wastes of a large population. The Potomac River, with a watershed of approximately 20,000 square miles, is, on the other hand, a tidal stream, and in addition to being used as a source of water supply and a means of disposal of sewage, has an important shellfish industry. The coastal waters, being salt in character, are used only for the two latter purposes.

In carrying on investigations of navigable waters, therefore, problems connected with three essentially different kinds of streams have been considered. General surveys have been made and intensive studies of special problems undertaken. These latter will be extended in connection with the general studies in order that facilities already provided may be utilized and in order that results of general application may be obtained.

In addition to the above, investigations have also been undertaken of a number of problems relating to municipal water supplies. All these studies are described below.

OHIO RIVER.

The investigations of the pollution of the Ohio River were begun in July, 1913, under the direction of Passed Asst. Surg. W. H. Frost. Cincinnati, Ohio, being the mid-point upon the river, was chosen as headquarters, and an unused part of the marine hospital building located in that city was repaired and equipped to serve as the administrative office and main laboratory. Pending the preparation of this building for use as a laboratory a preliminary survey of the Ohio River was accomplished, plans for the investigation were compiled in detail, considerable basic data collected and compiled, and arrangements made for the establishment and equipment of branch laboratories.

Prof. E. B. Phelps, Chief of the Division of Chemistry of the Hygienic Laboratory, though not permanently attached to the personnel of this investigation, has been closely associated with the work in the capacity of consultant, visiting the station from time to time to review the data collected and to assist in planning further extensions. He has in this way had a leading part in the work, more especially the chemical studies, which have been planned largely by him.

The Ohio River is about 960 miles in length from its origin at Pittsburgh to its mouth at Cairo, Ill. Directly upon its banks are situated urban communities, with an aggregate population of two and one-half millions, all discharging their wastes into the stream. During its course the river receives 16 large tributaries, each draining watersheds of more than 2,000 square miles, in addition to numerous smaller tributaries. Altogether the area drained by the Ohio comprises slightly more than 200,000 square miles, a territory embracing parts of the following States: New York, Pennsylvania, Maryland, West Virginia, Virginia, North Carolina, Georgia, Alabama, Mississippi, Tennessee, Kentucky, Ohio, Indiana, and Illinois. Upon this widely diversified territory is a population of approximately 14,500,000, of whom 9,350,000 are rural and the remaining 5,150,000 urban residents.

With such a large and diversified drainage area, with a course of nearly 1,000 miles in the main stream, in each mile of which the most complex biological changes are constantly taking place; with a discharge varying at Cincinnati from 4,000 to 650,000 second-feet, and with conditions of stream flow still further varied by numerous removable dams, constructed for the improvement of navigation, the Ohio River presents a fair composite of the broad and varied problems met in the study of stream pollution and purification. It is largely because of the representative character of the Ohio River, as well as because of its individual importance, that this stream was chosen as the object of this comprehensive study of fundamental principles of sewage disposal by dilution and of the natural processes of purification of streams; a study the primary intent of which is to yield results of general rather than local application.

This river, like practically all the large streams of the country, is extensively used for two purposes which are essentially opposed, namely, as the most convenient and cheapest means of disposal of wastes: and, at the same time, as the most readily available source of water supply for urban communities along its course. On account of its usefulness for both these purposes, the river constitutes an enormous economic and sanitary asset to communities upon its banks. The study which the service has undertaken is essentially a study in conservation of the sanitary resources of the river, with the object of determining by what balance between the two purposes mentioned the river can be made to yield its maximum of usefulness to the country through which it flows.

The investigations in progress embrace, in general, a study of the amount and character of the wastes discharged into the stream, their effects upon the stream, conversely the effects of the stream upon the wastes, and finally, most important of all, the immediate and remote effects which the pollution of the stream exercises upon the public health of adjacent communities.

The work has been directed simultaneously along several lines, chiefly the following: A study of the watershed of the Ohio River with reference to its extent, character, and population; a hydrographic study of the river and its tributaries; a general study of the total amount and character of wastes discharged into the river through its tributary streams, with a much more detailed study of the amount and character of wastes discharged directly into the main stream; an extensive study of the chemistry, bacteriology, and general biology of the river as affected by the discharge of wastes; and a careful survey of sanitary conditions existing in Ohio River communities, with special reference to the effects of stream pollution upon these conditions.

In carrying out the work the plan pursued has been to establish at suitable points upon the river a series of stations, all administered from and most minutely coordinated with the headquarters station. The chief work of the substations consists of the bacteriological and chemical examination of samples of water collected daily in their respective vicinities by motor boat and messenger service, each station covering from 15 to 40 miles of the river. The stretches of the river to be covered in this way have been carefully selected, with special reference to the opportunities they afford for studying the effects produced by the addition to the stream of known amounts of polluting material or diluting inflow. In other words, these stretches cover the areas within which the river receives the wastes from large cities or the waters of important tributaries.

Owing to the magnitude of the work involved in establishing and equipping such a series of stations, the necessity for preliminary studies to define the most advantageous locations and methods, and the necessity of building up for the investigation a thoroughly coordinated organization, the work has been developed gradually. Laboratory studies were begun at Cincinnati in November, 1913, and during the next month three substations were put into operation—at Pittsburgh, Pa., Portsmouth, Ohio, and Louisville, Ky., respectively. The work of these four laboratories, especially of the Cincinnati laboratory, was for the first two months devoted largely to developing the methods best adapted to the object in view; and it was only after satisfactory methods had been developed that the work was extended by establishing two additional stations and increasing the scope of work at those already established.

In order to secure entire uniformity the details of all methods to be employed in the collection and examination of samples have been embodied in full memoranda, and the scope of the work to be undertaken at each station precisely defined in full written instructions. To further insure coordination of the methods employed at each laboratory, more especially in bacteriological studies, where results are dependent so largely upon precision of technique, each laboratory worker upon being assigned to the work was detailed first to serve for several weeks in the main laboratory at Cincinnati in order to acquire by experience a more complete knowledge of details than can be conveyed through written instructions. Uniformity in bacteriological and chemical determinations has been still further insured by preparing at the Cincinnati laboratory all culture media and chemical standards used at the substations.

The data relative to area, topography, geology, and population of the Ohio River watershed are being worked up with special care, reviewing data previously collected and supplementing these by reassembling data from basic records.

Hydrographic survey.—An essential phase of the work is a careful hydrographic study, such as to furnish accurate data relative to stream flow of the Ohio River at various points and under varying conditions, also fair estimates of the time intervals required for flow between given points. This work is being carried on largely by District Engineer C. E. Ellsworth and Junior Engineer R. M. Adams, of the United States Geological Survey, who have been assigned by the Director of the Geological Survey to cooperate with the service collecting the scattered hydrographic records and supplementing these with additional field observations made during the current summer.

Waste pollution.—The wastes discharged into the river are being studied as to amount and character. From the larger cities, where studies of the local sewage disposal problems have been made by the city authorities, fairly complete records are available as to the amount and general character of these wastes. The amounts and kind of wastes discharged from the smaller, less compactly organized communities must, however, be estimated for each community by a careful field survey which is now in progress. In respect to one of the most important of the industrial wastes polluting the upper Ohio River, namely, the acid wastes from coal mines and from iron and steel plants, the Engineer Corps of the United States Army is cooperating with the service in a study of the source and amounts of these wastes. Detailed studies of the chemical and biological characteristics of representative wastes have been included in the program of the investigation, but it has been impossible to devote much time to this phase of study as yet, since the resources of the organization have been taxed to the fullest extent to keep up the other lines of field work.

Collection of samples.—For the bacteriological, biological, and chemical studies of the river as affected by the discharge of wastes, sampling points have been chosen with great care above and below the points of most definite and important pollution and near the mouths of the more important tributaries. Samples are collected at frequent intervals (daily or thrice weekly) from each of these sampling points by motor-boat service established at each laboratory. Cross sections of the river are accurately surveyed and three sampling points so chosen upon each section as to give a fairly balanced average sample of the water at that section. The greatest care has been exercised in selecting cross sections, in accurately locating the sampling points upon these sections, and in perfecting and unifying the methods of sample collection at the various laboratories. The plan being followed contemplates sampling from each point at sufficiently frequent intervals and over a sufficient length of time to give extensive data from which to derive broad averages and to observe variations consequent upon changes in the river due to fluctuations in volume, seasonal changes, and other variations. In the schedule of sample collection as many as possible of the tributary streams are included, and a more extended schedule for the summer months contemplates collection of samples by local collectors from tributary streams not accessible by motor boat from the laboratory stations.

Bacteriological studies.—In the bacteriological studies, which form the largest and most important single feature of laboratory work, special care has been exercised to develop a careful and uniform technique. On the whole, effort is being directed toward insuring thoroughness and uniformity in the examination of samples rather than to widely extending the number examined. At the same time the wealth of material collected is being utilized not only for a study of the special problems of stream pollution, but also for a careful study of methods of water examination in general. Approximately 10,000 samples have been examined bacteriologically during the past fiscal year; and, as the work during the summer will continue on a much larger scale, it is expected that this number of samples will have doubled by November 1, 1914.

Chemical studies.—Of chemical studies only those requiring to be done upon freshly collected samples and needing no special equipment are undertaken at branch laboratories. The most important of these studies are determinations of dissolved oxygen content so coordinated, under direction of Prof. Phelps, that they constitute an exhaustive study of the oxygen resources of the stream with reference to its capacity for sewage disposal under a wide range of conditions. Other studies being undertaken at the branch laboratories include daily determinations of alkalinity, this study being especially emphasized in the vicinity of Pittsburgh, where the river is highly polluted with acid wastes which exercise a most marked and important effect upon the biology of the stream. Sanitary chemical analyses and mineral analyses, having a more direct bearing on the quality of the river water with reference to its economic value, are made at the Cincinnati laboratory, the samples being collected at the more important of the sampling stations in the vicinity of the various branch laboratories. A total number of about 4,000 dissolved oxygen determinations, 1,500 alkalinity determinations, 500 sanitary chemical analyses, and 50 mineral analyses of composite samples have been made to the end of the past fiscal year.

Sanitary surveys.—Two working parties have undertaken a sanitary survey of the watershed, one party upon the upper and the other party upon the lower Ohio River. The party engaged upon the lower river are using as their base a house boat laboratory, which enables them, in connection with their survey, to make bacteriological studies of the water supplies of communities visited, as well as studies of the Ohio River at points intermediate between the fixed laboratories.

The survey party upon the upper river, where branch laboratories are more readily accessible, are working without a traveling laboratory, the purpose of such a laboratory being served in part by arrangements for sending weekly or semiweekly samples of municipal water supplies to laboratories in the immediate vicinity. The survey is being conducted by one medical officer and one sanitary engineer in each working party, a bacteriologist and one attendant being attached to the house boat to carry on the laboratory work.

The object of this survey is twofold, namely, to ascertain the amount and character of the wastes which each community contributes to the waters of the river, and to study the sanitary conditions existing in each community, with special reference to the direct and indirect influence of the pollution of the Ohio River in producing these conditions. Typhoid fever being the most reliable index of definite injury to the public health through stream pollution, the sanitary study of communities is directed especially to the prevalence of typhoid fever and the factors in its causation. Attention is being paid primarily to the water supply and methods of sewage disposal; but the systematic observations cover the sanitary organization and administration and such economic factors as have an important though indirect bearing upon public health.

Biological studies.—A biological study, dealing with plankton and higher forms of animal and vegetable life, was begun just before the close of the fiscal year, Biologist W. C. Purdy having been assigned to this duty. Although the importance of this line of study has been fully appreciated, it was impossible to begin it until similar studies on the Potomac River watershed had been completed.

As the work of this investigation is still in progress, and has indeed only recently reached its full extent, efforts are still being directed much more toward the collection than the compilation of data, so that it is not justifiable at this time to attempt conclusions as to the significance of the results so far obtained. The plan being followed contemplates continuing the investigation during the summer of 1914 upon its present scale, then greatly reducing the extent of field operations and devoting the winter months to careful compilation and analysis of the data obtained from field observations, continuing laboratory work on a smaller scale for the study of some of the special problems defined by the general survey.

Branch laboratories.—The following is a summary of the stations which have been established, the special work of each, and the personnel as distributed at the close of the past fiscal year.

Cincinnati, Ohio, 465 miles below Pittsburgh. Administrative office and main laboratory, Marine Hospital Building. Passed Asst. Surg. W. H. Frost, in general charge, assisted by seven scientific workers, and eight attendants.

Cooperating in the work conducted from this station are District Engineer C. E. Ellsworth and Junior Engineer R. M. Adams, detailed by the United States Geological Survey to assist in the work of the Public Health Service by making hydrographic studies of the Ohio River.

All administrative work, including the purchase of equipment and supplies and the preparation and distribution of culture media and standard chemical solutions, the compilation of data collected at branch laboratories, and all other work of a general nature, is done from this central station. The station at Cincinnati being more fully equipped than the substations, special chemical and bacteriological researches not included in the general routine are taken up here. Also for such chemical and bacteriological determinations as need not be made immediately, samples collected at the substations are forwarded to the Cincinnati laboratory. These determinations include mineral and sanitary chemical analyses of samples collected from all the stations and the identification of bacterial cultures isolated at other stations. By this plan of concentrating administrative and compilation work and special laboratory studies requiring more extensive equipment, it is possible to economize both in the personnel and the equipment of the substations.

In addition to the above-outlined work, the station at Cincinnati is utilized as a laboratory for study of the Ohio River in the immediate vicinity of Cincinnati, covering a territory extendng from just above the city to below the Great Miami River, altogether a stretch of more than 30 miles, within which the Ohio receives the inflow of the Little Miami, Licking, and Great Miami Rivers, and the sewage of the Cincinnati metropolitan district.

Pittsburgh, Pa.—Laboratory located in the United States marine hospital. Operations began in December, 1913. Passed Asst. Surg. Paul Preble in charge of the laboratory, assisted by two sanitary bacteriologists, and three attendants.

In view of the fact that the Pittsburgh metropolitan district constitutes the largest center of population on the Ohio River, this is the most important of the branch laboratories. The importance and interest of the study of the river at this point is increased by the unusual character of trades wastes, especially acid coal mine and iron wastes, with which the river is highly polluted in this vicinity; also by the conditions created by the series of dams constructed just below Pittsburgh for improvement of navigation. The territory covered from the Pittsburgh laboratory extends from above the city on both the Allegheny and Monongahela Rivers to just below the Beaver River, approximately 30 miles below Pittsburgh. The collection and examination of samples of water from the numerous municipal supplies in the Pittsburgh district adds still further to the work of this laboratory.

Wheeling, W. Va., 91 miles below Pittsburgh. Laboratory located in the United States post-office building. Operations began May 5, 1914. Sanitary Bacteriologist M. V. Veldee in charge of the laboratory; two attendants. Wheeling has been chosen as the site for location of the second branch laboratory for the reason that this city with its suburbs forms the next large center of population below Pittsburgh. The territory covered from this station extends from Steubenville, Ohio, about 65 miles below Pittsburgh, to Moundsville, W. Va., about 103 miles below Pittsburgh. In addition a large number of samples from the municipal supplies in the Wheeling district are regularly collected and examined at this laboratory.

Portsmouth, Ohio, 355 miles below Pittsburgh. Laboratory located in the First National Bank Building. Operations began in December, 1913. Sanitary Bacteriologist H. B. Corbitt in charge of the laboratory; one attendant. Portsmouth, Ohio, offers a favorable site for a branch laboratory as it is the last of a long series of towns located upon the river from Wheeling to Portsmouth and also is the point where the Scioto River empties into the Ohio. From

Portsmouth to Cincinnati, a distance of approximately 110 miles, the Ohio River receives no tributaries of important size and a negligible amount of direct sewage pollution, so that by coordinating the laboratory at Portsmouth with that at Cincinnati, an excellent estimate may be made of the biological changes which take place in this 100-mile stretch of river.

The station at Portsmouth has also been utilized for a thorough epidemiologic study of typhoid fever in that city and vicinity. It has been considered especially important to make a thorough study of typhoid fever in a representative city using highly polluted Ohio River water without purification. Portsmouth appeared to offer the best opportunities for this study, as it was expected that a filter plant would be installed ready to begin operation during the summer of 1914, so that a study of typhoid fever extending a year from the date of its inception in the fall of 1913 would cover a period of use of filtered water as well as a period of use of unfiltered water. This epidemiologic study was begun by Asst. Surg. L. R. Thompson at the time of his assignment to Portsmouth in November, 1913, continued by him until his transfer from that station in April, 1914, and brought up to date since that time by Asst. Surg. M. H. Neill. Every case reported in Portsmouth since September 1, 1913, has been personally canvassed for complete epidemiologic study, a total of 238 cases having been studied to date. Owing to delays in construction, it appears probable that the projected filter plant will not be completed within the year covered by this study.

Louisville, Ky., 600 miles below Pittsburgh. Laboratory located in the United States marine hospital. Operations began January 1, 1914. Sanitary Bacteriologist J. W. McBurney in charge of the laboratory; two attendants. Louisville being the third largest city upon the river and the next town of important size below Cincinnati, a laboratory has been located in that city for the study, first, of the effects of Cincinnati sewage upon the river at Louisville, and, second, the effects of the Louisville sewage upon the stream below that point. The opportunity for studying the effects which the sewage of Cincinnati exercises upon the river at Louisville is very favorable, since the Ohio receives no considerable sewage pollution between the mouth of the Great Miami River and Louisville, and in this stretch receives only one important tributary—the Kentucky River.

Paducah, Ky., 925 miles below Pittsburgh. Laboratory located in the City National Bank Building. Operations began May, 1914. Sanitary Bacteriologist A. M. Besemer in charge of the laboratory; two attendants. A laboratory was established at Paducah, Ky., 30 miles above the mouth, rather than at Cairo, Ill., for the study of the Ohio River at its mouth, for the reason that from Paducah it is possible to study also the waters of the two largest tributaries of the Ohio River, namely, the Cumberland and Tennessee Rivers, which flow into the Ohio within a few miles of Paducah.

Upper Ohio River sanitary survey.—Asst. Surg. L. R. Thompson and Sanitary Engineer R. E. Tarbett, Passed Asst. Surg. Paul Preble cooperating in survey in the vicinity of Pittsburgh.

Sanitary survey of lower Ohio River.—Asst. Surg. Liston Paine, Sanitary Engineer J. K. Hoskins, Sanitary Bacteriologist W. E. Brown; one attendant.

POTOMAC RIVER.

The studies of the pollution of the Potomac River referred to in the last annual report (p. 42) were continued and the field work completed during the fiscal year.

The personnel conducting the work were the director of the Hygienic Laboratory, in general supervision; Surg. Hugh S. Cumming, in immediate charge of the work; Prof. Earle B. Phelps, Division of Chemistry, Hygienic Laboratory, in charge of the chemical work; five scientific workers and the necessary attendants.

The actual work of collecting and analyzing samples of mud, water, and shellfish was begun June 2, 1913, and carried on daily, with only such occasional unavoidable interruptions as were caused by ice in the river or accidents to vessels until May 29, 1914.

Samples were collected from Marshall Hall to above the city of Washington by using the launch *Virginia*, loaned by the District of Columbia, and from the lower section by the use of a gasoline launch chartered for that purpose. Samples from the section from Chain Bridge to Marshall Hall were collected by officers on the *Virginia*, iced, and brought to the Hygienic Laboratory for bacteriological and chemical analysis, except samples for determination of dissolved oxygen, which were handled in part on the launch. The samples from the lower portion of the river were examined at the laboratory established at Colonial Beach, Va., and placed in charge of Asst. Surg. W. F. Draper.

Special Expert W. C. Purdy, with headquarters at Washington, collected plankton samples by means of the launch and small boats and studied them during the winter months.

In November it became evident that the two launches then in use were insufficient to cope with the work planned, and the service steamship *W. D. Bratton*, attached to the Philadelphia quarantine station, was transferred to Washington, D. C., for use in the investigations. Since that time this vessel, with bacteriologists and chemists on board, has been employed for the collection and analysis of samples of mud, water, and shellfish between Washington and the mouth of the river, a laboratory having been installed on board.

A sanitary survey of the entire watershed was made by Surg. Cumming and Sanitary Engineer H. P. Letton. Advice as to the purification of water supplies and safe disposal of sewage was given by these officers to various communities. Their survey showed an alarming number of deaths from typhoid fever in the watersheds both of the South Branch and North Branch of the Potomac River. Subsequent to their inspection and at the request of the State board of health an intensive study of rural sanitation was begun by the service in Berkeley County, W. Va., described more fully elsewhere in this report. (See p. 59.)

The sanitary survey of the upper portion of the river showed the importance of the investigation of industrial wastes in that region, and Sanitary Chemist W. F. Wells was detailed to make special studies of conditions at Cumberland, Piedmont, and neighboring communities and at Harpers Ferry. During this investigation he used the laboratory of Cumberland, Md., by courtesy of the city health officer.

The sanitary survey also showed the number of tanneries and large amount of wastes therefrom on the watershed. This industrial waste has been deemed of such importance that a special study of this kind of waste is being made at Luray, Va., by sanitary engineers under supervision of the professor of chemistry, Hygienic Laboratory.

The amount of work done during the investigation may be judged by the fact that in addition to the sanitary survey of all communities in the watershed, which covers an area of 13,000 square miles, 9,652 samples of water have been examined bacteriologically to determine the presence of sewage organisms; 138 samples of mud collected and examined; 541 samples of oysters (5,410 or more individual oysters) analyzed to determine the presence of sewage organisms; 381 samples of water, mud, and plants studied to determine the plant and plankton forms in the river and their effect upon pollution; and between 3,000 and 4,000 samples analyzed for different chemical determinations.

In addition to this work the same force analyzed 82 samples of oysters (820 oysters) and 131 samples of water collected in the upper Chesapeake Bay and tributaries by a representative of the Bureau of Chemistry, Department of Agriculture, on the United States Fish Commission steamer *Fish Hawk* and shipped to the Hygienic Laboratory. These samples are valuable for comparison with those collected in the Potomac River investigation.

One of the most important factors in the study of this problem is the hydraulic data relating to tidal flow, velocity, amount of stream water, and other questions. Request was accordingly made of the Coast and Geodetic Survey, through the Department of Commerce, to furnish this data, and that service promptly put out a field party, which has been working since August, 1913.

The questions involved are matters of moment from both an economic and a sanitary point. The Potomac River throughout nearly all of its course is an interstate stream; its watershed includes parts of the States of Pennsylvania, Maryland, Virginia, and West Virginia, and the riparian rights in its lower section are under the joint jurisdiction of two States, while the most important pollution is that from the District of Columbia.

The study of the sanitary conditions of the river is therefore of importance not only because of local conditions but because the river is a type of many other rivers and tidal estuaries within whose waters are extensive shellfish layings. The work done has been exhaustive, and it is expected the results will prove of permanent benefit and serve as a guide in the study of similar bodies of water. Owing to the large amount of data collected and the importance of thoroughly digesting it, some time will be consumed in preparing the final report of the investigation.

During the investigation valuable assistance has been rendered by the Coast and Geodetic Survey, the United States Geological Survey, the Census Bureau, and the State health officers of Maryland and Virginia by furnishing charts and data, and the superintendent of sewers of the District of Columbia by delivering samples of sewage, furnishing the launch *Virginia*, and extending other courtesies.

COASTAL WATERS.

The shellfish industry, especially the gathering from natural beds or growing of oysters, and their distribution, has long been one of the most important sources of wealth and of food in many of our coastal States. Until comparatively recent years shipments of raw oysters were necessarily more or less local in extent, but with the increase in refrigerating and transportation facilities and more efficient organization of both producers and distributors at inland points, the shellfish industry has become national in its importance.

From an economic point this is true, for the industry now amounts to from $15,000,000 to $16,000,000 annually; and it is of sanitary importance because of the number of cases of typhoid fever which have been attributed to the ingestion of raw shellfish. The rapid growth of many communities along the coast increases the amount of infectious pollution of our coastal waters, and oysters grow precisely in these localities where the ocean waters meet the land waters, which bring down those substances serving directly or indirectly as their food.

While it is known to sanitarians that shellfish do sometimes convey such diseases as typhoid fever under certain circumstances and conditions, and while some notable work has been accomplished by local and State authorities, the problems of just what conditions are necessary to insure safety from infective shellfish have not been solved.

The activities of the Federal Government have been chiefly directed in the past to the examination of interstate shipments of shellfish to be used as food. Under the act approved August 14, 1912, the Public Health Service is authorized to study the pollution of navigable waters of the United States, and it is believed that a comprehensive study of the coastal waters bears not only an important relation to the public health, but is also a matter of moment to those coastal communities whose sewage is now, in some instances, polluting the very beds from which their chief source of wealth is derived.

Chesapeake Bay and estuaries.—With approval of the department, it was determined to extend the investigation of the pollution of tidal waters already begun in the Potomac River, and Surg. Hugh S. Cumming was detailed to take charge of studies in the tidal waters of Virginia and Maryland, which will have for their object the determination of the character and extent of the pollution and its effect upon the public health, and will include sanitary surveys of watersheds and laboratory examinations of samples of mud, water, and shellfish.

In order to provide laboratory facilities and transportation the steamer *Bratton* has been continued in this service and equipped with a complete field laboratory.

It was not desired to have this work interfere with the completion of the Potomac River investigation, and hence it was begun about June 1, since which time 132 samples of water and 105 samples of oysters (1,050 oysters) have been collected and analyzed from Baltimore Harbor (Patapsco River), Annapolis Harbor (Severn River), Back River, Rappahannock, South Pianketank, Great Wicomico, Honya, Manokin, and Big Annemessex Rivers, and from most of the waters of the Chesapeake Bay, from the Maryland-Virginia line up to the entrance of Baltimore Harbor. In view of the great importance of the oyster layings of the lower bay and Hampton Roads, a more intensive study of that locality will be made the coming year.

In order to solve certain important problems connected with the conveyance of infectious disease by shellfish, a temporary field laboratory has been transferred from Colonial Beach to the United States Quarantine Reservation at Fisherman's Island, Va.

These investigations have met with the hearty approbation of the health officers of the various States as well as the National Association of Shellfish Growers. The State officials have in some instances already cooperated by furnishing maps of their oyster beds and the governor of Virginia has directed the various officials of the State board of fisheries to render every assistance.

Mississippi Sound, Miss.—In January, 1914, Passed Asst. Surg. R. H. Creel was detailed to make an investigation of coastal waters in the vicinity of Gulfport and Biloxi, Miss., with special reference to possible pollution of shellfish entering into interstate traffic from that section.

The sanitary survey of the oyster beds and their surroundings was conducted by Passed Asst. Surg. Creel, in company with Inspector W. H. Hartigan, of the Bureau of Chemistry, Department of Agriculture, and lasted from January 26 to February 5, 1914. At this survey a number of points were selected to collect samples of water and oysters. These samples were afterwards examined by Dr. Creel at the laboratory of the marine hospital at Mobile, Ala.

It was found that the sewage from Gulfport (a town of 7,000 inhabitants) was discharged into Missisippi Sound in the immediate vicinity of oyster beds. A similar condition prevailed at Biloxi, a town of 9,000 people in winter, the oyster beds in the vicinity of which were also exposed to sewage pollution from Ocean Springs, a town with about 2,000 inhabitants. The water and oyster samples examined from both localities showed *B. coli*, as could be expected from the existing sewage pollution.

For the abatement of these conditions, which offered a serious menace to the public health, there were two remedies—removal of the oyster beds to an uncontaminated location or suppression of the pollution. At Gulfport the oyster cultivation was of such small extent that it seemed unjustifiable to make any change in the present disposal of sewage. The most practicable solution appeared, therefore, to be the prohibition of oyster cultivation and gathering within 1 or 1½ miles of the sewer outlet.

At Biloxi the situation is more complicated, the best solution probably being the treatment of the sewage, as otherwise a new sewage system will have to be constructed or the oyster beds removed a distance of possibly 2 miles from the sewer outlet.

The complete report of Dr. Creel's investigation has been published in Hygienic Laboratory Bulletin No. 96.

WATER SUPPLY OF WILMINGTON, N. C.

In response to a request received from the mayor of the city of Wilmington, N. C., and with the approval of the North Carolina State Board of Health, Prof. E. B. Phelps, Chief of the Division of Chemistry, Hygienic Laboratory, was instructed to proceed to the above-mentioned city to make an investigation of its water supply, its character, and possible improvements.

Prof. Phelps's investigation lasted from November 28 to December 3, 1913, during which time he made a careful inspection of the city waterworks and present and possible sources of supply in the Cape Fear River, and collected a number of samples of water for examination.

As the result of his examination he came to the conclusion that on the whole the water of the East Branch of the Cape Fear River now used by the city, although distinctly polluted by the sewage of Wilmington, is a suitable water for purification and undoubtedly superior to waters used by many cities in the United States. Until other arrangements could be made, every effort should tend to maintain the purification plant at the highest possible degree of efficiency, and to this end certain changes were recommended by Prof. Phelps.

The objections to the present water supply were considered by Prof. Phelps under the following aspects: Possible danger of infection in case of accidental failure of the water plant, esthetic objections to the use of water with a history of pollution, and the rather large quantity of sulphate of aluminum required for purification.

In view of these objections, Prof. Phelps studied the feasibility of other sources of supply that had been suggested, especially deep wells and other river intakes. The deep-well project was found to involve many elements of uncertainty and to be definitely lacking in that it would supply an undesirable hard water. Of the various alternative projects that were suggested the extension of the intake to the Northwest Branch of the Cape Fear River seemed the most promising, and Prof. Phelps recommended that the necessary engineering, chemical, and bacteriological studies be undertaken to determine the cost of the project, the characteristics of the water, its freedom from pollution, and the possible saving in purification expenses. Prof. Phelps recommended that no final decision should be reached until after an impartial presentation of all the facts was made to the citizens of Wilmington.

Prof. Phelps's complete report has been published as Reprint No. 161, from the Public Health Reports.

WATER SUPPLY OF CLINTON, N. C.

At the request of the mayor of the city and of the county health officer, Sanitary Engineer H. P. Letton was, with the approval of the State board of health, directed on February 2, 1914, to proceed to Clinton, N. C., to advise the local authorities in regard to the best source for a proposed water supply.

Mr. Letton found under consideration three possible plans of obtaining a sufficient water supply for the town—one from underground sources; the other two contemplated the utilization of surface streams, namely, Williams Old Mill Branch, near the border of the town, and Coharie Creek, a large stream about 3 miles west of the town.

The advantages and disadvantages of the different projects were carefully weighed, and a report was submitted to the local authorities. It was recommended that a competent sanitary engineer should be employed by the city to study the three projects more in detail before final action was taken, and advised also that special attention be given to obtaining a water supply from wells before considering the other two possible sources of supply, the objections to which were pointed out.

INDUSTRIAL WASTE STUDIES.

The proper disposal of waste liquors resulting from various manufacturing processes constitutes one of the most serious features of the problem of the prevention of stream pollution. While the general importance of this subject is very great its importance in individual cases has not as a rule been sufficient to justify any special study upon the part of those interested. Only in those cases where restrictive legislation or court proceedings have made it absolutely necessary has any attempt been made to investigate the possibilities of purification methods applied in this field. There are certain industries which are so generally distributed over large sections of the country as to make the study of their stream pollution problems a matter of general rather than local interest.

Because of this feature and also because of the large volume of exceedingly offensive waste liquors which are discharged from tanneries this particular industry seemed to be especially suitable for an investigation into the possibilities of waste disposal. Arrangements were made accordingly with the officials of a tannery located at Luray, Va., and a plant for the experimental study of the disposal of waste liquors was established, under the direction of Prof. E. B. Phelps, Chief of the Division of Chemistry, Hygienic Laboratory. Similar considerations have led to the preparation of plans for another plant to be located at some point in Indiana for study of wastes produced in the strawboard industry.

SEWAGE DISPOSAL STUDIES.

A great deal of attention has been given during the past quarter century to the disposal of sewage from large cities, and as a result a considerable mass of knowledge has been obtained from which it is possible to-day to determine with some degree of certainty the results of various types of treatment upon various kinds of sewage. In the case of sewage from small communities and individual dwellings the problem has never been of sufficient magnitude to call for such elaborate investigation, and present-day practice in this field is far behind the best engineering practice in the larger field referred to. There is a growing need for more knowledge of ways and means for the disposal of sewage of isolated dwellings, small institutions, summer hotels, and the like.

With these facts in mind it has seemed exceedingly desirable to undertake some investigations along this line. Two installations have been designed and built for this purpose. Both are experimental in nature, being exceedingly flexible and capable of modification or substitution of one part for another without difficulty. One plant has been located upon the grounds of the Hygienic Laboratory at Washington, and is connected with an adjoining nurses' home in the grounds of the Naval Hospital, being served by a population of about 25 people. The second is located in a suburb of Washington, connected to a small private sewer with a contributing population of about 50 people. Both plants are now in operation. The one at the Hygienic Laboratory, which is the more comprehensive, comprises biolytic and Imhoff tanks, trickling, contact and sand filters, and apparatus for sterilization by means of hypochlorite or liquid chlorine.

Sanitary privy.—Some attention has also been given to a sanitary privy for use where a water supply is not available. Designs have been prepared for a cheap installation which combines the characteristics of a privy without the water-carriage system, and of a modern sewage-disposal plant utilizing biological principles. This privy has not yet been constructed.

PROJECTED SEWERAGE AT HUNTINGTON, W. VA.

In compliance with a request received from the mayor of Huntington, W. Va., and with the approval of the State Board of Health of West Virginia, Sanitary Engineer R. E. Tarbett was instructed to proceed to Huntington to advise the city authorities in regard to the construction of a new trunk sewer.

Mr. Tarbett found two plans had been considered by the authorities, one placing the trunk-sewer outlet about 1½ miles above the intake of the city water supply, the other immediately below the intake. After adopting, on account of the smaller cost, the first plan, considerable opposition developed, the discharge of sewage above the intake being deemed a danger to health. No objection was expressed to locating the sewer outlet at the intake, it being the opinion of the citizens that the discharge of sewage just immediately below the water plant would produce no contamination of the water used.

In studying the various problems involved, attention was paid not only to the conditions of stream flow as they now exist in the Huntington district of the Ohio River, but as they will exist after the completion of a dam now under construction. The improvement and needs of the district to be served, the possible increase in population, the effects of the construction of the dam, the location of the water-works intake with reference to existing as well as proposed sewer outlets were also considered.

As a result, Mr. Tarbett came to the conclusion that it would seem advisable to construct a sewer as planned above the water-works intake to be used, however, as a storm-water sewer, but not for sanitary purposes until the intake was either removed well above it or otherwise protected from possible contamination. He discouraged the construction of the sewer immediately below the intake as proposed in the alternative plan, suggesting instead that the outlet should be placed at a sufficient distance below the intake to prevent contamination.

DISCHARGE OF SEWAGE FROM BRONX VALLEY INTO THE HUDSON RIVER.

At the suggestion of the Attorney General, an expression of opinion was requested on July 23, 1913, by the War Department in regard to the advisability from a public-health standpoint of granting a permit to the Bronx Valley sewer commissioners for the temporary discharge of sewage from five villages in the Bronx Valley into the Hudson River pending the completion of a sewage disposal plant, then in construction.

After considering the various aspects of the situation, the War Department was informed that the prevention of the further pollution of New York Harbor and its tributary waters represented a definite program on the part of the Federal and the New York State authorities for the gradual elimination of the pollution and the improvement of existing conditions. The establishment of the purification plant referred to must, therefore, be deemed an important step in that direction.

Pending completion of this disposal plant, no immediate harm to the public health could result from the temporary use of the sewer in question, since the waters which it was intended to protect are now polluted by the sewage of some seven millions of people. It was stated, however, that the temporary permission for the use of the sewer should be limited to May 1, 1914, the date suggested by the Attorney General, since it seemed feasible, with ordinary diligence, to complete the purification plant by that time.

TWELFTH ANNUAL CONFERENCE OF STATE AND TERRITORIAL HEALTH AUTHORITIES.

In accordance with provisions in law, the Twelfth Annual Conference of State and Territorial Health Authorities with the service was held in Washington, D. C., June 18, 1914. A larger number of delegates were present than at any previous conference, 25 States, 2 Territories, and the District of Columbia being represented.

The following subjects were discussed: Morbidity reports, transportation of tuberculous persons, school hygiene, rural sanitation, education in public health matters, industrial camp sanitation, railway sanitation, quarantine procedure, ice and water used by common carriers in interstate traffic, industrial hygiene, and sanitary organization.

The only resolution adopted by the conference consisted in a request for the appointment by the Public Health Service of officers of State and Territorial health departments as collaborating epidemiologists in order to facilitate the notification and control of communicable diseases.

The transactions of the conference will be issued as a public health bulletin.

Sixth International Sanitary Conference of the American Republics.

Pursuant to a resolution adopted at the Fifth International Conference of the American Republics, held at Santiago, Chile, November 5–12, 1911, the next conference is to be held at Montevideo, Uruguay.

The following announcement and provisional program of the conference were issued by the Surgeon General in his capacity as provisional charman of the International Sanitary Bureau organized under the provisions adopted at previous conferences:

INTERNATIONAL SANITARY BUREAU OF THE AMERICAN REPUBLICS,
Washington, D. C., March 7, 1914.

In compliance with the resolution adopted at the Fifth International Sanitary Conference, the Sixth International Sanitary Conference of the American Republics will be held in Montevideo, Uruguay, December 13–21, 1914, under the presidency of Dr. E. Fernández Espiro and the auspices of the Government of Uruguay.

A number of important sanitary subjects will be discussed at this conference, and it is expected that all the nations interested will be duly represented.

PROVISIONAL PROGRAM FOR THE SIXTH INTERNATIONAL SANITARY CONFERENCE OF THE AMERICAN REPUBLICS, TO BE HELD AT MONTEVIDEO, URUGUAY, DECEMBER 13-21, 1914.

1. Review of sanitary legislation enacted in the different countries since the fifth conference.
2. Report of progress made in adopting the resolutions agreed to in preceding conferences.
3. Reports on morbidity and mortality statistics subsequent to the last conference.
4. Recent developments in the campaign against plague, yellow fever, leprosy, trachona, malaria, hookworm disease, tuberculosis, and venereal diseases.
5. Measures adopted to combat the prevalence of cerbro-spinal meningitis and acute anterior poliomyelitis.
6. Progress made in maritime sanitation since the last conference, especially with reference to the opening of the Panama Canal.
7. Data relating to the work of the sanitary information bureau of Montevideo.

In view of a recent law forbidding participation by the Executive in foreign meetings unless specifically authorized by Congress, a resolution providing for such representation has been introduced in Congress, and its passage recommended by both the Treasury and State Departments.

INTERNATIONAL OFFICE OF PUBLIC HYGIENE.

The sessions of October, 1913, and April, 1914, of the Permanent Committee of the International Office of Public Hygiene, a bureau established at Paris, France, by a convention of the participating Governments, were attended by Surg. J. M. Eager, Public Health Service, as representative of the United States. The following Governments are now participants in the arrangement under which the international office is formed: Algeria, Argentina, Australia, Belgium, Bolivia, Brazil, British India, Bulgaria, Canada, Chile, Denmark, Egypt, France, Great Britain, Holland, Italy, Mexico, Monaco, Norway, Persia, Peru, Portugal, Russia, Servia, Spain, Sweden, Switzerland, Tunis, Turkey, United States of America, and Uruguay.

During these sessions the following subjects were considered in certain of their relations to public health: Tuberculosis, cold storage, biological purification of water for use in hospitals, the campaign against insects instrumental in the propagation of disease, melitensis fever, cholera, venereal diseases, typhoid fever, leprosy, and the deratization of ships.

Tuberculosis.—Relative to the campaign against human tuberculosis the following resolution was adopted:

The campaign against tuberculosis can not be efficaciously pursued by the sanitary authorities of the different countries unless all cases of open tuber-

> culosis and deaths due to tuberculosis are brought to the knowledge of these authorities. It is therefore desirable that such declaration be rendered obligatory. The declaration to be practical should be so made as to be secret and should be attended by the possibility of medical care of those interested, of measures of isolation or of prophylaxis, and, if necessary, of assistance.

In response to an interrogatory relative to the campaign throughout the world against insects capable of transmitting infectious diseases, numerous communications were made by representatives of the different countries.

Cholera.—The committee on cholera considered a resolution adopted at the session of April 1913 (see p. 38, annual report for 1912), to the effect that to arrive at definite conclusions in regard to measures designed to obliterate cholera, research should be made to determine the manner in which the cholera germ continues to exist in inter-epidemic periods in countries where the disease is endemic. The committee on cholera consisted of Dr. Marc Armand Ruffer, representing Egypt; Prof. Calmette, Algeria; Dr. Francisco de Veyga, Argentina; Dr. J. M. Eager, United States; Surg. Gen. Sir Benjamin Franklin, British India; Dr. N. Freyberg, Russia; Dr. Angel Pulido, Spain; Dr. Th. Madsen, Denmark; and Dr. Pottevin, assistant director of the international office. The Permanent Committee was unanimous in adopting a conclusion arrived at by the committee on cholera that at present it would be inexpedient to present to the Governments participating in the international office the suggestions necessary to make realizable the researches in question.

Communications were made by various representatives relative to the deratization of ships, but no conclusion was reached and the consideration of the subject is to be continued at the next session of the Permanent Committee.

Leprosy.—Relative to leprosy the following resolution was adopted:

> From the exchange of observations brought about by the activities of the Permanent Committee, it is learned that no new foci of leprosy have appeared in Europe outside of countries where old foci have long existed. The sanitary situation, therefore, as regards leprosy in Europe, does not present an alarming character. Nevertheless, the persistence of old foci and the fact that increasing travel leads to the emigration from these foci of a small number of lepers, make the prophylaxis of leprosy a question of present importance, principally in countries where leprosy forms foci or presents a broad extension. The measures that should be taken include obligatory declaration, special surveillance, isolation, and exclusion of alien lepers.

Venereal diseases.—A large number of communications were presented on venereal diseases, reflecting a wide diversity of views on the subject in different countries as evidenced by the character of legislation or by its absence, as relating to certain phases of this social question. The conclusion, however, was that the public authorities in different countries in charge of prophylaxis of venereal disease should take all opportune measures to make the treatment of these maladies easily accessible to all classes of the population, and that, above all, every condition that tends directly or indirectly to prevent or retard the treatment of these maladies during their contagious period should be suppressed radically and without hesitation.

Antityphoid vaccination.—In regard to antityphoid vaccination, the conclusion was reached that abundant facts furnish the proof that vaccination increases resistance against natural typhoid infection. The benefits of its application in reducing morbidity and mortality from typhoid among groups of persons gravely exposed to the infection are real and considerable. Evidence is lacking of a negative phase, and, as a result of the absence of reduced resistance, the vaccination may be practiced where an epidemic is present. Though the time has not yet come, the committee concluded, to insist upon systematic vaccination of the whole population, with a view to creating a general immunity, studies of the duration of immunity following vaccination, of contraindications, even though rare, of the occurrence of carriers among the vaccinated persons, of the various techniques of vaccination, and of the relative value of the different materials used should be actively pursued in the interest of public health.

Representation at Meetings of Scientific and Sanitary Associations and Congresses.

During the year the service was represented at the following meetings:

Washington State Medical Association, Everett, Wash., July 17, 1913.
Association of Massachusetts Boards of Health, Boston, Mass., July 31, 1913.
International Conference on Infant Mortality, London, England, August 4–5, 1913.
Conference of Vermont Health Officers, Burlington, Vt., August 4–7, 1913.
International Congress of Medicine, London, England, August 6–12, 1913.
American Pharmaceutical Association, Nashville, Tenn., August 18–23, 1913.
International Congress on School Hygiene, Buffalo, N. Y., August 25–30, 1913.
American Hospital Association, Boston, Mass., August 26–29, 1913.
Pennsylvania Homeopathic Medical Society, Bedford Springs, Pa., September 2–4, 1913.
American Public Health Association, Colorado Springs, Colo., September 8–13, 1913.
Association of Military Surgeons, Denver, Colo., Sept. 16–19, 1913.
Mississippi Valley Medical Association, New Orleans, La., October 23–25, 1913.
Committee on Rural Nursing, American Red Cross Association, New York, N. Y., October 22, 1913.
Southern Medical Society, Lexington, Ky., November 18–20, 1913.
American Electrical Railway Association, Atlantic City, N. J., October 13–17, 1913.
Virginia State Medical Association, Lynchburg, Va., October 21–24, 1913.
Conference of Arkansas Health Officers, Little Rock, Ark., October 28–29, 1913.
Ohio Valley Medical Association, Evansville, Ind., Nov. 5–6, 1913.
Clinical Congress of Surgeons of North America, Chicago, Ill., November 10–15, 1913.
Association for Prevention of Pollution of Rivers and Waterways, Chicago, Ill., November 11–12, 1913.
American Association for Study and Prevention of Infant Mortality, Washington, D. C., November 14–17, 1913.
Southern Medical Association, Lexington, Ky., November 18–20, 1913.
New York State Health Officers, Utica, N. Y., November 19–22, 1913.
West Virginia Health Officers, Parkersburg, W. Va., November 28, 1913.
Conference of Kentucky Health Officers, Louisville, Ky., December 8–10, 1913.
International Congress of Hygiene and Safety, New York, N. Y., December 11–19, 1913.
American Society of Experimental Pathology, Philadelphia, Pa., December 29–31, 1913.
American Pharmacological Society, Philadelphia, Pa., December 29–31, 1913.
American Physiological Society, Philadelphia, Pa., December 29–31, 1913.
American Association for Advancement of Science, Atlanta, Ga., December 29, 1913–January 3, 1914.
American Association for Labor Legislation, Washington, D. C., December 30–31, 1913.

National Conference on Race Betterment, Battle Creek, Mich., January 8–12, 1914.
National Council of Safety, Chicago, Ill., January 20, 1914.
Southeastern Sanitary Association, Columbia, S. C., February 12–13, 1914.
New York State Ventilation Commission, New York, N. Y., February 17–18, 1914.
Conference of American Medical Association on Public Health Legislation and Medical Education, Chicago, Ill., February 23–24, 1914.
Federation of State Medical Boards, Chicago, Ill., February 25, 1914.
Chicago Medical Association, Chicago, Ill., February 25, 1914.
Maryland Conservation Association, Baltimore, Md., February 25, 1914.
Indiana Sanitary and Water Supply Association, Indianapolis, Ind., February 26–27, 1914.
Illinois Water Supply Association, Urbana, Ill., March 9–11, 1914.
Hygiene Committee, National Council of Industrial Safety, New York, N. Y., March 12, 1914.
Eighth District Medical Society of North Carolina, Greensboro, N. C., April 2–3, 1914.
American Chemical Society, Cincinnati, Ohio, April 7–10, 1914.
American Association of Pathologists and Bacteriologists, Toronto, Canada, April 9–11, 1914.
National Commission on Milk Standards, New York, N. Y., April 13, 1914.
California Society for the Study and Prevention of Tuberculosis, Santa Barbara, Cal., April 13, 1914.
Iowa Health Officers, New Orleans, La., April 20, 1914.
National Drainage Congress, Savannah, Ga., April 22–25, 1914.
Virginia Public Health Association, Charlottesville, Va., April 23, 1914.
American Nurses' Association, St. Louis, Mo., April 23, 1914.
International Congress on Child Welfare, Washington, D. C., April 26, 1914.
Maryland Medical and Chirurgical Faculty, Baltimore, Md., April 28–30, 1914.
National Association for Study and Prevention of Tuberculosis, Washington, D. C., May 7–9, 1914.
American Association for Promoting Hygiene and Public Baths, Newark, N. J., May 13, 1914.
National Conference on Charities and Corrections, Memphis, Tenn., May 15, 1914.
Oyster Growers and Dealers' Association, Atlantic City, N. J., May 19–20, 1914.
Vermont Health Officers' Association, Bellows Falls, Vt., May 21, 1914.
American Medico-Psychological Association, Baltimore, Md., May 26–29, 1914.
Vermont Health Officers' Association, Rutland, Vt., May 28, 1914.
American Society of Tropical Medicine, Boston, Mass., May 28–30, 1914.
Conference of Kansas Health Officers, Rosedale, Kans., June 8–10, 1914.
Massachusetts Medical Society, Boston, Mass., June 9–10, 1914.
North Carolina State Medical Society, Raleigh, N. C., June 16–18, 1914.
Surgeons' Association, Baltimore & Ohio Railroad, June 18, 1914.
American Association of Medical Milk Commissions, Rochester, N. Y., June 19–20, 1914.
Eugenics Research Association, New York, N. Y., June 19–20, 1914.
American Medical Association, Atlantic City, N. J., June 22–25, 1914.
Pacific Coast Federation for Sex Hygiene, San Francisco, Cal., June 29–July 1, 1914.

EDUCATIONAL LECTURES.

Mention has been made under different headings of the educational lectures delivered by officers of the service in the course of investigations and surveys.

In addition a number of popular addresses were presented before miscellaneous audiences and public meetings, as follows:

Summer school for teachers, State University, Chapel Hill, N. C., July 14, 1913.
Summer school for teachers, State Normal School, Goldsboro, N. C., July 15, 1913.
Public meeting, Cumberland, Md., August 14, 1913.

Farmers' meetings, fifth congressional district of North Carolina, August 25–September 6, 1913.

Farmers' meetings, sixth congressional district of Alabama, September 8–20, 1913.

Public meeting, Martinsburg, W. Va., October 8, 1913.

Public meeting, health day, National Conservation Exposition, Little Rock, Ark., October 25, 1913.

Teachers' conference, Lonaconing, Md., October 31, 1913.

Public meeting, Selma, Ala., December 29, 1913.

Public meeting, Atlanta, Ga., January 3, 1914.

City Club, Baltimore, Md., February 7, 1914.

Medical College of Virginia, Richmond, Va., February 10, 1914.

New York Academy of Medicine, New York City, February 12, 1914.

Massachusetts Nautical School, Boston, Mass., February, 1914.

Georgia State Industrial College, Savannah, Ga., February 19, 1914.

Maryland Medical and Chirurgical Society, Baltimore, Md., March 9, 1914.

Public meeting, Cumberland, Md., March 13, 1914.

Public meeting, Huntington, W. Va., September 3, 1914.

Public meeting, Baltimore, Md., April 14, 1914.

Public meeting, Gaithersburg, Md., April 17, 1914.

Public meeting, Sandy Spring, Md., April 21, 1914.

State Normal School, Shepherdstown, W. Va., April 22, 1914.

Public meeting, Germantown, Md., April 24, 1914.

Merchants' and Manufacturers' Association, Baltimore, Md., April 28, 1914.

Public meeting, Rockville, Md., May 5, 1914.

Public meeting, Laytonville, Md., May 8, 1914.

Public meeting, Brookville, Md., May 12, 1914.

Training School for Boys, Bellbuckle, Tenn., May 13, 1914.

Public meeting, Silver Spring, Md., May 15, 1914.

Medical department of the University of South Carolina, Charleston, S. C., June 4, 1914.

Summer School of the South, State University, Knoxville, Tenn., June 23–July 10, 1914.

Among the subjects discussed at these meetings were rural sanitation, prevention of disease, civic sanitation, typhoid fever, malaria, Rocky Mountain spotted fever, pellagra, isolation hospitals, maritime quarantine, infectious diseases, and personal hygiene.

MARITIME QUARANTINE.

The United States Public Health Service, in order to afford protection to the ports of the United States, its possessions, and dependencies, inspected during the fiscal year 1914, 14,128 vessels, of which number 2,731 were fumigated either for the destruction of rats or mosquitoes. On these vessels there were 1,549,570 passengers. When the fact is taken into consideration that all immigrants entering the United States are examined with a view to the quarantinable diseases as well as for those diseases deportable under the immigration laws the medical officers of the Public Health Service during the past fiscal year have examined, all told, 3,035,527 persons.

The volume of work performed at the United States quarantine stations during the fiscal year 1914 exceeds that for the year 1913—7,821 vessels having been inspected during 1913 in comparison with 9,388 during the fiscal year just passed.

The year has marked many improvements at the various quarantine stations of the service, both in connection with increased facilities and equipment and the general betterment of the public property. The port of Providence is being equipped with a complete floating quarantine plant, and a floating quarantine plant has also been provided at San Pedro, Cal. During the year the quarantine steamer *Neptune*, stationed at Philadelphia, has been equipped with the most modern type of funnel gas apparatus for rat extermination on board vessels. A description of this apparatus will be found under the heading "Quarantine stations" (Philadelphia).

The measures for the uniform destruction of rats on vessels which were inaugurated August, 1912, are being carried out with certain minor modifications. Vessels arriving from the following groups of ports are fumigated for the destruction of rats:

1. All ports in South America, including the river ports.
2. All African ports, including the Azores, Cape Verde Islands, and Madeira.
3. All Asiatic ports.

Vessels from the West Indian ports are subjected to fumigation at certain intervals, there being special regulations for Cuban and Porto Rican ports on account of the past infection of Habana and San Juan. The above-mentioned regulations were last revised in a few minor particulars on August 4, 1913.

The activities of the bureau have been especially directed against the importation of plague from Habana, Cuba, in which port the disease reappeared on February 22, 1914, about a year and a half after its former appearance there in the month of July, 1912. The presence of the disease during this fiscal year was confirmed on March 6, 1914, and on March 7 the following instructions were sent by the bureau to its representative at Habana, and all quarantine officers were notified accordingly:

1. Passengers from Habana to be passed upon special certification in order to exclude those originating in infected districts.
2. Persons directly exposed to infection to be detained for seven days prior to departure.
3. Freight from noninfected localities and other freight rendered rat free to be passed upon special certificate.
4. Vessels bound to United States ports to be fumigated immediately after discharge of cargo to kill rats, after which vessels to be prohibited from lying against lighters or alongside wharves, except those certified to be rat proof.
5. Notations to be made upon every bill of health issued to departing vessels, with recommendations to quarantine officers at United States ports.

Plague in Cuba.

As stated above, the first case of the present outbreak of plague in Cuba was discovered February 22, 1914, at No. 1 Officios Street, Habana, which is in the block adjacent to that in which the first two cases appeared in 1912. Whether this second occurrence of plague was simply a continuation of the old infection or a new importation can not definitely be settled. The former is the more reasonable view, and is the one voiced by the health authorities at Habana. The case of February 22 was followed by 24 other cases, making a total of 25 within the city limits of Habana up to June 30, 1914.

Two other cases were found in the neighborhood of Habana, the first at Artemisa, 45 kilometers to the southwest of the city, on April 18; the second at San Jose de las Lajas, a town about 25 kilometers southeast from Habana, on June 15.

As the infection in both these cases was clearly traceable to Habana and they were treated in that city, these properly belong with the Habana series. However, as they have been considered separately in the reports sent to the bureau, they will not be included in the Habana series.

On May 30 an infected rat was found in the freight station in the town of Jaruco, 37 kilometers to the eastward of Habana, on the railway between that city and Matanzas. The station and surrounding structures were disinfected, and there were no further developments.

On June 23 a case suspicious of plague was reported from Santiago de Cuba, in the eastern extremity of the island. On the following day, the 24th, it was reported negative by the local board of health. On the 27th it was again reported as suspicious after examination by Dr. Recio, an officer of the Habana laboratory of the health department. The case was a mild one and was convalescing, and it became necessary to await inoculation tests and the result of the exposure of guinea pigs in the infected locality in order to determine the diagnosis. However, the existence of well-marked rodent plague in Santiago de Cuba was demonstrated on June 29, and on July 8 the suspicious case of June 23 was announced as positive of plague. In the meantime two other suspicious cases were found, both of which were decided negative.

It may be considered as more than probable that the spread of plague infection outside of the original focus in Habana was due to the action of a wholesale provision merchant, who, when one of his employees sickened with what he thought might be plague, and later was confirmed as such, concealed it, and, knowing that as soon as the case was discovered his warehouse would be quarantined and fumigated, disposed of as much of his stock as possible, sending it to various parts of the city of Habana and throughout Cuba, including the subsequently infected points, San Jose de las Lajas and Santiago de Cuba. He is at present being prosecuted before the courts.

It should be observed that two weeks prior to the appearance of the first case of the present outbreak the sanitary authorities had noted some rat mortality. Antirat measures were put in effect at once, even before the discovery of the first human case of plague. With a few exceptions all the cases may be traced directly or indirectly to the original focus near the Habana water front.

A secondary well-marked focus developed later in the extensive stables of the department of public works in Figuras Street. Two infected rates were found there, the first on April 17, the second on April 24. This focus gave rise to six cases.

On account of the character of the buildings and grounds, disinfection by the usual methods was futile, and the sanitary department decided to destroy the infection by fire. The stables and everything within them except the animals, carts, and harness were converted into ashes on April 25. This radical measure was effective in destroying a very menacing focus of infection. No other case developed from this source, except perhaps one, whose place of business, No. 2 Concha Street, was on the route taken by the employees, animals, and equipment of the stables destroyed when they were moving into new quarters.

Medical Officers Detailed at Mexican Ports.

In accordance with the usual custom medical officers of the service were assigned to duty in the American consulates of the following Mexican ports: Tampico, Vera Cruz, Puerto Mexico, Frontera, and Progreso.

The tour of duty in these ports begins April 1 and ends November 1, the "close quarantine season" for purposes of protection from yellow fever infection. On April 24 all of these officers were withdrawn, with the exception of those stationed at Vera Cruz, on account of orders issued by the State Department for all consular officers to leave Mexico.

Public Health Service Officers Detailed to Serve Under the Commander in Chief of the United States Naval Forces at Vera Cruz, Mexico.

The bureau issued orders on April 23, 1914, for Surgs. G. M. Guiteras and R. H. von Ezdorf to proceed to Vera Cruz, Mexico, for duty under the orders of the United States naval commander in chief. Having reported for duty upon arrival on April 28, Surg. Guiteras, with Surg. von Ezdorf as his assistant, was assigned to shore duty under Admiral Fletcher. Subsequently these officers were assigned to duty under Gen. Funston upon the relief of the naval forces on shore by the Army.

PORT SANITARY STATEMENTS.

The Port Sanitary Statement, issued by the Public Health Service, replaces the "Bill of health" formerly issued by collectors of customs to vessels bound to foreign ports. The change was inaugurated by the following department circular:

ISSUANCE OF PORT SANITARY STATEMENTS TO VESSELS DEPARTING FROM UNITED STATES PORTS BY MEDICAL OFFICERS OF THE UNITED STATES PUBLIC HEALTH SERVICE.

1914.

Department Circular No. 25, Bureau of Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, April 9, 1914.

To medical officers of the United States Public Health Service, collectors of customs, and others concerned:

Form 1964, "Port Sanitary Statement," a copy of which is inclosed, will hereafter replace the form "Bill of health" heretofore used by collectors of customs for issuance to vessels departing from United States ports.

The duty of issuing the said port sanitary statements will in future be performed by medical officers of the United States Public Health Service and should not be performed by collectors of customs, as heretofore, except as noted below.

At ports where Public Health Service officers are not available the collectors of customs should issue the port sanitary statement, as heretofore.

A supply of these forms may be obtained upon letter requisition, pending the usual formal requisitions for stationery and supplies.

W. G. MCADOO, *Secretary.*

Below is a copy of the new form:

PORT SANITARY STATEMENT.

UNITED STATES PUBLIC HEALTH SERVICE.

Port of..
Vessel: ....
Bound from .... to ....
Number of cases of and deaths from the following-named diseases reported during the two weeks ending ...., 191

Diseases.	Number of cases.	Number of deaths.	Remarks. (Any condition affecting the public health existing in the port to be stated here, including operations in rodent examination and extermination.)
Cerebrospinal meningitis (epidemic)........................	....	....	....
Cholera, Asiatic........................	....	....	....
Diphtheria........................	....	....	....
Measles........................	....	....	....
Plague........................	....	....	....
Poliomyelitis (acute anterior poliomyelitis)........................	....	....	....
Scarlet fever........................	....	....	....
Smallpox........................	....	....	....
Typhoid fever........................	....	....	....
Typhus fever........................	....	....	....
Yellow fever........................	....	....	....
Total	....	....	....

Vessel last fumigated at ...., ..., 191
Given under my hand and seal this .... day of ...., 191
[SEAL.] ....,
Surgeon, U. S. Public Health Service.

THE CERTIFICATION OF FREIGHT IN FOREIGN PORTS.

The following circular letter was issued for the guidance of American consular officers and Public Health Service officers in interpreting the United States quarantine regulations as they relate to freight from ports infected or suspected of being infected with plague or cholera:

Bureau Circular Letter No. 39.

TREASURY DEPARTMENT,
BUREAU OF THE PUBLIC HEALTH SERVICE,
Washington, May 15, 1914.

To officers of the United States Public Health Service, consular officers, and others concerned:

The object of this circular is to facilitate the interpretation of certain paragraphs in the United States quarantine regulations relating to the certification of freight in foreign ports when destined for United States ports and to aid consular officers and medical officers of the United States Public Health Service, when assigned to duty in United States consulates in foreign countries, in deciding upon the treatment to be accorded in individual cases.

PARAGRAPHS OF THE QUARANTINE REGULATIONS RELATIVE TO THE CERTIFICATION OF FREIGHT.

(*a*) Paragraph 13, page 22:

Bedding, upholstered furniture, soiled wearing apparel, personal effects, and second-hand articles of a similar nature, coming from a district known to be infected with cholera, smallpox, typhus fever, or as to the origin of which no positive evidence can be obtained, and which the consular or medical officer has reason to believe are infected, should be disinfected prior to shipment. In the case of typhus fever, the destruction of vermin should be assured. Articles similar to the above mentioned, if from a district infected by plague, should be inspected, and, if necessary, disinfected and treated to destroy vermin.

(*b*) Paragraph 14, page 22:

Articles from an uninfected district shipped through an infected port may be accepted without restriction if not exposed to infection in transit.

(*c*) Paragraph 17, page 22:

Any article presumably infected which can not be disinfected should not be shipped.

(*d*) Paragraph 27, page 25:

Certain food products, viz, unsalted meats, sausages, dressed poultry, fresh butter, fresh milk (unsterilized), fresh cheese, coming from cholera-infected localities or through such localities, if exposed to infection therein, should not be shipped. Fresh fruits and vegetables from districts where cholera prevails shall be shipped only under such sanitary supervision as will enable the inspector to certify that they have not been exposed to infection.

(*e*) Paragraph 28, page 25:

All rags and textile fabrics used in the manufacture of paper and for other purposes which are collected, packed, or handled in any foreign port or place, with the exceptions as hereinafter specified, shall, prior to shipment to the United States, be subjected to disinfection by one of the prescribed methods. (Jute bags or bagging used in baling cotton, old rope, new cotton, or linen cuttings from factories not included.) The disinfection of the articles mentioned above shall be performed under the supervision of a United States consul or a medical officer of the United States, and a certificate in duplicate, signed by said consul or medical officer, shall be issued with each consignment of same, which certificate shall identify the articles and state that they have been disinfected in accordance with the United States Quarantine Regulations. The original certificate of disinfection shall be attached to the consignee's invoice, and where the articles are carried by sea the duplicate certificate of disinfection shall be attached to the bill of health issued to the vessel conveying the same.

Exceptions.—Such articles shipped from the Dominion of Canada directly to the United States shall be exempt from this requirement if accompanied by affidavits demonstrating to the satisfaction of the collector of customs at the port of arrival that they have actually originated in Canada and have not been shipped from a foreign country to Canada, and thence shipped to the United States; and, further, that the port or place where collected or handled has been free from quarantinable disease for thirty days prior to shipment.

(*f*) Paragraph 39, page 27:

Articles which harbor or are liable to harbor rats or rat fleas should not be shipped until freed of such vermin, either by the use of chemicals, fumigation, or solutions, or by preventing the access of rats for fifteen days before shipment. The nature of the merchandise and the place and method of stowing prior to shipment must be considered in determining its liability to be a rat or vermin carrier, thus: Bundles of hides, bags of grain, etc., so stowed as to be used as nesting places for rats would be flea, and might be rat, carriers.

When the cargo of a vessel consists of grain or other rat food, extra precautions should be taken to prevent rats from going aboard.

Hides, chemically cured, are not liable to harbor rats or rat fleas, and loose, single hides are less liable to do so than when baled.

CERTIFICATION OF FREIGHT FROM LOCALITIES INFECTED OR SUSPECTED OF BEING INFECTED WITH PLAGUE.

1. In the case of vessels which have been rendered rat free by fumigation just prior to receiving cargo the following cargo may be loaded without treatment:

a. Filled rat-proof containers, such as kegs, barrels, cans, boxes, or cases.

b. Moist or green and dry hides, if the bundles are opened to inspection to determine freedom from rats.

NOTE.—Paragraph 15, page 22, of the quarantine regulations should invariably be borne in mind in connection with the certification of hides, and particular attention should be given to any other regulations as to the importation of live animals.

Paragraph 15. Nothing in these regulations shall be construed to modify or affect in any way any existing restrictions promulgated by the Secretary of the Treasury at the instance of the Secretary of Agriculture regarding the importation of hides of neat cattle.

c. Upholstered furniture, general personal effects, and second-hand articles, curios, feathers, mattresses, matting, wool and furs, crated bamboo ware, plants, bulbs and seeds, rope, cuttings, bones, tendons, bonemeal, hides, horns, hoofs, hair, bristles, etc., if it can be determined that the articles and their containers are rat free.

NOTE.—If the consular or medical officer is unable to make arrangements for determining whether the articles are rat free, then two courses of action are open. One is to have the freight fumigated for the destruction of rats, and the other is to recommend against the shipment of the freight and make a special report of the incident for the quarantine officer at the United States port of arrival.

2. In the case of vessels which have not been rendered rat free by fumigation just prior to receiving cargo, the following cargo may be loaded without treatment:

Filled rat-proof containers, such as kegs, barrels, boxes, or cases.

NOTE.—In case cargo not coming within this classification is shipped, the officer issuing the bill of health should notify the quarantine officer at the port of destination, so that he may, in his discretion, require fumigation of the vessel to kill rats prior to removal of cargo or inspections of the cargo to determine its freedom from rats.

FUMIGATION OF CARGO.

The fumigation of cargo incapable of being injured by sulphur gas should be carried out by exposure for six to twelve hours, according to the character of the freight, to sulphur dioxide gas 4%. Freight which would be injured by sulphur gas may be treated, if practicable, by hydrocyanic gas (see paragraph 188, U. S. Quarantine Regulations), but extreme care is necessary to guard against danger to human life.

CARGO WHICH CAN NOT BE DISINFECTED.

Paragraph 17: "Any article presumably infected which can not be disinfected should not be shipped."

CARGO TO BE PROHIBITED SHIPMENT FROM PLAGUE-INFECTED OR PLAGUE-SUSPECTED PORTS.

Fruits and vegetables, especially potatoes and onions, unless packed in tight boxes or containers, or else in crates protected by ½-inch wire mesh.

MISCELLANEOUS FREIGHT NOT COVERED IN ABOVE CLASSIFICATION.

Human hair, if treated by immersion in kerosene oil, may be passed, also human hair arranged in hanks and packed so that it will not harbor rats or fleas. Hair other than human, bristles, and feathers should be immersed in kerosene oil if originating in infected or suspected localities. Soiled wearing apparel should invariably be boiled, steamed, or exposed to formaldehyde gas in an air-tight compartment. If formaldehyde be used, follow directions in either paragraph 165 or 166, page 48, of the United States Quarantine Regulations.

FREIGHT FROM CHOLERA-INFECTED PORTS.

Certification of freight with regard to cholera depends solely upon whether it contains foodstuffs which may have become infected in the process of packing. In the event there is doubt as to whether such articles are liable to convey the infection of cholera, they are not to be subjected to any process of fumigation, but are simply to be rejected and the facts reported to the quarantine officer at the port of arrival, in the event shipment is made despite the rejection of the freight. Unsalted meats, sausages, dressed poultry, fresh butter, fresh milk (unsterilized), fresh cheese, fresh fruits and vegetables, and the like should not be shipped from cholera-infected localities.

RAGS.

Rags should be considered separately from old gunnies, bags, ropes, etc. The latter should be considered from the standpoint of their liability to harbor rats and fleas. Rags are especially covered by the regulations (see paragraph 28, page 25, U. S. Quarantine Regulations) and should be disinfected by steam under pressure, or else by one of the recognized processes for the preliminary treatment of rags, as follows:

1. The rags are placed in a brick oven and subjected to sufficient heat to dry them out thoroughly. Then a spray of hydrochloric acid is passed through them for a period of one hour, or until every fiber of cotton is abslutely penetrated. The spray is then turned off, and the rags are again subjected to heat until they are absolutely dry again. They are then taken to a shaker into which heat is injected and thoroughly dusted out. They are then taken to a large vat and thoroughly washed with clean water to neutralize the effect of the acid. A modification of this method, also acceptable, may be described as follows:
2. The rags are first dried until they are absolutely free from moisture, and then they are placed in a revolving cylinder and again subjected to the drying heat. They are then treated with muriatic acid fumes until all vegetable matter is destroyed. They are then well shaken out to remove the carbonized vegetable dust, and afterwards washed in clean water to neutralize the acid, and finally dried.
3. The rags are boiled, with or without soda solution. They are then dried and packed in tight bales.

EGGS.

Eggs packed in rice-straw ashes with a considerable percentage of table salt may be certified without reservation. Hides, horns, hoofs, etc., may be passed if certified to be free from rats.

Form of Certificate to be Used by the United States Consular Officers and, When Practicable, to be Countersigned by Medical Officers of the United States Public Health Service.

CERTIFICATE OF DISINFECTION OR OF NONINFECTION.

No. —— American Consulate ——— ———,
——— ———, 19—.

I, the undersigned ——— ——— of the United States of America, at ———, do hereby certify that the goods, wares, merchandise, animals, or articles or commodities described in consular invoice No. ——, dated ———, and issued by this consulate ———, have been fumigated, disinfected, or otherwise treated, or exist in the condition specified below, therein meeting the requirements of the quarantine regulations of the United States of 1910, and other instructions as noted, to wit:

(Specimen or sample entries.)

22 bales (mark 1–22) moist hides; inspected; rat free.

6 cases human hair (mark J. D. S. 1–6). Immersed in kerosene oil.

400 bags bonemeal (mark P. M. S. 1–400). Stored 60 days in premises free from plague infection.

Countersigned:

——— ———,
Surgeon, U. S. P. H. S.

In witness whereof I hereunto set my hand and seal of the consulate ——— of the United States at ———, this —— day of ———, 191—.

[SEAL.]

Fee, $——.

Consul ——— ———.

RUPERT BLUE, *Surgeon General.*

Table giving transactions at national quarantine stations for the fiscal year ended June 30, 1914.

Stations.	Steamers inspected.	Sailing vessels inspected.	Total vessels inspected.	Vessels spoken and passed.	Vessels quarantined.	Vessels fumigated.	Total passengers and crews inspected.
Alexandria	2		2				20
Beaufort, S. C		1	1				7
Biscayne Bay	42	101	143	205		22	8,070
Bocagrande, Fla		26	26	83	3	8	1,089
Brownsville, Tex							1,823
Brunswick, Ga	18	10	28	42		14	2,177
Cape Charles	566	8	574		4	67	34,623
Cape Fear	60	4	64	2		14	1,538
Charleston, S. C	152	4	156		1	17	4,985
Columbia River, Oreg	54	81	135			27	4,301
Cumberland Sound	87	72	159	52		4	3,427
Delaware Breakwater	12	4	16			1	1,097
Eagle Pass							20,673
Eastport, Me	878	49	927				60,809
El Paso, Tex							
Eureka, Cal	29		29				777
Everett, Wash	3		3				133
Georgetown, S. C							
Gulf Quarantine	154		154	4	4	83	2,686
Hoquiam, Wash	5	65	70			1	670
Key West, Fla	589	53	642			20	59,408
Ketchikan, Alaska	97		97				6,890
Laredo, Tex							13,522
Mobile, Ala	436	227	663		18	182	13,025
Morgan City, La	14		14			2	125
New Orleans, La	1,272	16	1,288	219	99	140	74,513
Nome, Alaska	22		22				22
Pascagoula, Miss	78		78	5		15	726
Pensacola, Fla	81	46	127			93	7,304
Perth Amboy, N. J	133		133	4		56	3,896
Port Angeles, Wash		1	1				10
Port Hartford, Cal	91	12	103				3,429
Port Inglis, Fla	22		22	15	1		604
Portland, Me	143	75	218			3	20,974
Port Royal, S. C							
Port Townsend, Wash	170	56	226	3		65	31,962
Providence, R. I	40		40		5		21,521
Philadelphia, Pa	915	37	952			219	102,885
San Diego, Cal	366	2	368	5	223	4	13,164
San Francisco, Cal	498	113	611	3	1	191	85,660
Santa Barbara, Cal. (Los Angeles)	1	9	10				191
San Pedro, Cal. (Los Angeles)	96	1	97			6	6,308
Savannah, Ga	149	6	155	4		39	4,736
South Bend, Wash	1	6	7				50
St. Andrews, Fla			26			10	347
St. George Sound	28		28			14	261
St. Johns River	45	58	103	195		9	1,612
St. Josephs, Fla			43			10	678
Tampa Bay, Fla	142	85	227	1		65	6,213
Total	7,491	1,228	8,788	842	359	1,420	628,941

REPORTS FROM THE NATIONAL QUARANTINE STATIONS.

During the fiscal year ended June 30, 1914, at the various stations in the United States, a total of 8,546 vessels were inspected, including 1,401 disinfected, either for the destruction of mosquitoes as a precaution against the introduction of yellow fever or for the destruction of rats and other vermin as a precaution against plague.

In addition 842 vessels were spoken and passed, making a grand total of 9,388 vessels and 616,124 passengers and crews passing under the observation of the service at ports in continental United States.

Following are the summaries of the operations at the various quarantine stations:

Alexandria, Va.—Acting Asst. Surg. Arthur Snowden in charge. Two vessels were inspected and passed. At Alexandria, Va., the quarantine inspection is also made of vessels destined to Washington, D. C.

Atchafalaya, La.—Acting Asst. Surg. W. T. McClellan in charge. Fourteen vessels, carrying 125 passengers and crew, were inspected and passed.

Biscayne Bay quarantine.—Post office and telegraphic address, Miama, Fla. Acting Asst. Surg. James M. Jackson, jr., in charge. Two hundred and five vessels were spoken and passed. Forty-two steamers and 101 sailing vessels were inspected and passed. These vessels carried a total of 8,070 passengers and crew. One steamer and 21 sailing vessels were fumigated.

The large majority of the vessels arriving come from the Bahama Islands, Nassau being the port of departure for most of them, owing to the fact that the American consul is there, and the necessity of obtaining a consular bill of health. They are engaged principally in the carrying of alien immigrants and small cargoes of tropical fruits in season, and the exportation of lumber and supplies for the islands. Being mostly schooners, some of them have auxiliary power in the form of gasoline engines installed in them to be used in time of storm or calm.

The passenger accommodations are very poor at best, and oftentimes in the rush are much overcrowded. It is not uncommon for a two-masted schooner to come in with as many as 50 passengers and 10 crew. While on the bills of health the passengers are divided into first-class and steerage, they all seem to have the same privileges and accommodations—a large majority of them sleeping upon the decks.

The immigrants are a very healthy class and free from all communicable or deportable diseases. On account of the fines assessed some years ago by the immigration department for bringing immigrants with deportable diseases, when so certified by the medical officer in charge, they now maintain a very rigid inspection at port of departure and it is seldom one is found who has to be certified for deportation. These immigrants are very largely of the African race and come in fall, winter, and spring to work in vegetable and fruit farms, returning to their homes with the beginning of summer to spend the heated term. While the above is the rule, many of them make Miami their home and some take out naturalization papers.

During the past year great care and close search for rats and mosquitoes has been made of all vessels entering the port. Vessels showing the presence of rats have been fumigated. At first this met with opposition, but lately the ship masters are more than willing to cooperate, as they see the benefits of ridding their vessels of rats. The orders for the fumigation of all vessels from foreign ports at least once in four months have been strictly adhered to, or oftener if the presence of rats showed the need of it.

Boca Grande quarantine.—Post-office and telegraphic address, South Boca Grande, Fla. Acting Asst. Surg. G. E. Atwood in charge.

Summary of transactions during the fiscal year ending June 30, 1914:

Vessels entering port	120
Vessels spoken and passed	83
Vessels inspected and passed	26
Vessels fumigated	8
Vessels held for completion of quarantine	3
Total number of crew inspected	1,084
Total number of persons temperature was taken	98
Total number of passengers inspected	5

No quarantinable or reportable disease was encountered during the years.

Brunswick (*Ga.*) *quarantine.*—Acting Asst. Surg. J. A. Moncure in charge. Forty-two vessels were spoken and passed, 18 steamers and 10 sailing vessels inspected and passed, 4 steamers and 10 sailing vessels disinfected. Nineteen hundred and fifty-one crew on steamers, 194 crew on sailing vessels, 31 passengers on steamers, 1 passenger on sailing vessels.

Cape Charles quarantine.—Post office and telegraphic address Fort Monroe, Va. Acting Asst. Surg. J. Ward McCaffry reports 566 steamers and 8 sailing vessels inspected and passed and 67 vessels fumigated.

Cape Fear quarantine.—Acting Asst. Surg. J. Arthur Dosher in charge. Sixty-four vessels arrived at quarantine during the year, 60 steamers and 4 sailing vessels; 12 steamers and 2 sailing vessels were disinfected; 46 steamers and 2 sailing vessels were inspected and passed; 2 steamers were spoken and passed. Total number of crew examined was 1,538.

Charleston, S. C.—Passed Asst. Surg. H. M. Manning in charge. One hundred and fifty-two steamers and 4 sailing vessels were inspected and passed and 17 vessels fumigated.

Columbia River (*Oreg.*) *quarantine and subports.*—Post-office and telegraphic address, Astoria, Oreg. Passed Asst. Surg. H. G. Ebert in command.

During the year 54 steamers and 81 sailing vessels were inspected and passed, 27 vessels were fumigated, 3,897 crew and 409 passengers were inspected.

No vessel has arrived during the last fiscal year with quarantinable disease aboard; with the exception of two cases of smallpox remaining from last year there has been no detention of persons in quarantine.

The two cases referred to were a case from the U. S. S. *St. Louis*, and a case transferred from Astoria at the request of the local health officer and on bureau authority, both discharged recovered.

An inspection of all vessels from Seattle was instituted under bureau orders, those certified by the medical officer in charge of the service work at Seattle were passed, those not certified were fumigated for the destruction of rats before being allowed to proceed.

In a number of cases, particularly where vessels from Seattle were due at night, to prevent delay in boarding these vessels were certified by telegraph from Seattle and were allowed to pass without further inspection at Astoria.

Vessels from dangerous localities, liable to harbor rats, have been fumigated if empty or sufficiently so to insure an efficient fumigation; if loaded and to complete discharge in Portland, fumigation has been delayed until empty and has been done under the supervision of the service officer in charge at Portland. Certain vessels with transit cargo aboard were not fumigated, but subjected to strict antirat regulations while in port.

Cumberland Sound quarantine.—Post-office and telegraphic address, Fernandina, Fla. Acting Asst. Surg. J. Louis Horsey in charge. Fifty-two vessels were spoken and passed, 87 steamers were inspected and passed, and 72 sailing vessels were inspected and passed. On these vessels there were 3,427 passengers and crew. Four steamers were fumigated.

Delaware Breakwater quarantine.—Post-office and telegraphic address, Lewes, Del. Acting Asst. Surg. George G. Hart, in charge. Twelve steamers and 4 sailing vessels were inspected and passed.

The United States battleship *Ohio* arrived at the Delaware Breakwater at 8 a. m., Thursday, December 25, 1913, from Marseille, France, via Guantanamo, Cuba, and Charleston, S. C. This vessel had landed 10 cases of smallpox and 16 suspects at Guantanamo, also 2 cases at Charleston. There were 2 cases on board upon arrival at the breakwater. On account of the stormy weather, communication with the vessel was impossible until Saturday evening, December 27, when about 600 pieces of baggage were landed and were immediately fumigated by formaldehyde in vacuo. Two mild cases of smallpox, accompanied by nurse, were landed the same evening and placed in the isolation ward. On Sunday, December 28, 22 officers and 573 men were landed, together with 623 pieces of baggage. The entire personnel were bathed and furnished a clean change of clothing, which had been fumigated the previous night, and all were assigned to quarters, the 22 officers to the cabin-passenger building, 276 men to the north barrack, and 297 to the south barrack. The clothing worn upon landing was immediately fumigated, and the baggage, which had been isolated, was fumigated on Sunday night and Monday. The personnel remaining on the ship consisted of 12 officers and 143 men, under the direct observation of the naval medical officer. The battleship was fumigated by formaldehyde. The personnel detained ashore were under military discipline, medical inspections being made twice daily, at 9 a. m. and 4 p. m. On January 2 one suspicious case developed, which was isolated. The personnel of his compartment were bathed, clothing and compartment fumigated. This was repeated with another case on January 3. Revaccination of the negative cases was done. There were 3,068 pieces of baggage fumigated, After the proper period of detention was completed the vessel was discharged in free pratique on January 16, 1914.

Eastport (Me.) quarantine.—Acting Asst. Surg. John E. Brooks in charge. Eight hundred and seventy-eight steamers and 49 sailing vessels have been inspected and passed. These vessels carried 60,809 passengers and crew.

Eureka, Cal.—Acting Asst. Surg. Charles C. Falk reports that during the year 29 steamers were inspected and passed.

Gulf quarantine station.—Post-office and telegraphic address, Biloxi, Miss. Acting Asst. Surg. W. R. P. Thompson in charge.

Transactions.

Vessels entering quarantine	158
Inspected and passed	67
Spoken and passed	4
Fumigated and passed	83
Fumigated and held	4
Crew inspected	2,671
Passengers inspected	15

Hoquiam (Wash.) subport.—Acting Asst. Surg. T. C. Frary reports 4 steamers and 65 sailing vessels were inspected and passed and 635 passengers and crew were inspected.

Key West (Fla.) quarantine.—Acting Asst. Surg. S. D. W. Light in charge. During the year a total of 642 vessels were inspected, of which 589 were steam and 53 sailing vessels. A total of 59,408 persons were inspected, of which 36,968 were crews of steam vessels, 401 crews of sailing vessels, 21,923 passengers on steamers, and 116 passengers on sailing vessels. A total of 11 steamers and 9 sailing vessels were fumigated during the year.

Ketchikan, Alaska.—Acting Asst. Surg. Henry C. Story reports as follows: Ninety-seven vessels were inspected and passed, together with 6,890 passengers and crew.

Mobile (Ala.) quarantine.—Passed Asst. Surg. E. A. Sweet in charge. The following is the summary of the vessels entering Mobile quarantine during the year, with the persons on board and their disposal:

Vessels entering quarantine		663
Steamers	436	
Sailing vessels	227	
Inspected and passed		463
Fumigated and passed		176
Fumigated and held		6
Detained for observation		18
Passengers inspected		608
Officers and crew inspected		12,417

New Orleans (*La.*) *quarantine.*—Surg. G. M. Corput in charge.

Tranasactions.

	Tonnage.	Number of crew.	Number of passengers.	Number of ships.
Steamers inspected and passed	3,578,557	46,233	13,375	1,272
Steamers fumigated and passed	455,648	4,179	173	110
Steamers inspected and detained to complete 6 days	221,261	3,047	2,496	60
Steamers fumigated and detained to complete 6 days	54,978	560	101	20
Steamers fumigated and detained for 6 days	950	14	....	1
Steamers inspected and detained to complete 7 days	6,791	107	....	3
Steamers detained for diagnosis	9,696	156	34	4
Steamers fumigated outbound	4,514	51	....	2
Steamers having crews and passengers detained at quarantine to complete 6 days	3,041	59	60	3
Sailing vessels inspected and passed	22,069	956	5	16
Sailing vessels fumigated and passed	1,591	20	1	2
Sailing vessels inspected and detained to complete 6 days	869	9	4	1
Sailing vessels fumigated and detained to complete 6 days	3,188	38	....	3
Sailing vessels fumigated and detained for 6 days	2,956	44	1	2
Naval vessels passed on medical officer's certificate	9,783	1,417	....	4
Naval vessels inspected and passed	11,675	760	36	3
Naval vessels inspected and detained to complete 6 days	45,000	205	352	2
Steamers boarded and passed	....	....	....	1
Total, exclusive of vessels spoken and passed	4,432,567	57,875	16,638	1,509
Steamers spoken and passed	....	....	....	218
Sailing vessels spoken and passed	....	....	....	1
Total	....	....	....	1,728
Vessels fumigated	522,337	4,883	276	139

SUMMARY.

Vessels, temperatures taken on	909
Total temperatures taken:	
Crew	33,055
Passengers	12,814
	45,869
Sick in hospital	34
Number with quarantinable diseases	0
Total persons handled	74,515

During the period from April 26 to May 28 the New Orleans quarantine station was the center of great activity on account of the detention there of refugees from Mexican ports. During the period above mentioned 3,000 men, women, and children were held in quarantine for varying periods of time, according to circumstances. In order to handle this large number of persons it was necessary to construct an emergency camp with a capacity for a thousand persons. This camp consisted of tents of the Army hospital type pitched upon tent floors which were constructed well above the ground level. Only four refugees were placed in each tent, so that there was no overcrowding, and from the fact that no illness developed during the detention of the refugees which could be chargeable to the detention itself it may be seen that the details of water supply and sewage disposal were successfully carried out.

Nome, Alaska.—Acting Asst. Surg. J. M. Sloan in charge. Twenty-two steamers and one sailing vessel were inspected and passed.

Pascagoula (*Miss.*) *quarantine.*—Acting Asst. Surg. W. A. Cox in charge. During the fiscal year ending June 30, 1914, Pascagoula quarantine station has been under the charge of Acting Asst. Surg. B. F. Duke, who died April 7, 1914, and Acting Asst. Surg. W. A. Cox, his successor.

Report of service transactions at said station for the year follows:

Vessels inspected and passed	78
Vessels fumigated	15
Vessels fumigated at port of departure	14
Vessels spoken and passed	5
Officers and crew	695
Passengers	31

Pensacola (*Fla.*) *quarantine.*—Acting Asst. Surg. W. Barnes in charge.

Transactions.

Total vessels entering quarantine	220
Steamers inspected and passed	81
Sail vessels inspected and passed	46
Steamers inspected and fumigated	28
Sail vessels inspected and fumigated	65
Provisional pratique furnished, unloading under rat guards and then fumigated	6
Crew inspected	5, 531
Sick treated in hospital	1
Officers and enlisted men of United States Army inspected	1, 773
Total number of rats killed as result of fumigation	604

No quarantinable disease was found during the year.

Perth Amboy (*N. J.*) *quarantine.*—Acting Asst. Surg. Charles W. Naulty, jr., in charge.

Transactions.

Steamers inspected and passed	133	
Steamers spoken and passed	3	
Sailing vessels inspected and passed	0	
Sailing vessels spoken and passed	1	
Total number of vessels		137
Crews on steamers	3, 879	
Crews on sailing vessels	0	
Total crews		3, 879
Passengers	17	
Stowaways	0	
Steamers fumigated for destruction of rats	56	
Sailing vessels fumigated for destruction of rats	0	
Total fumigated		56
Steamers presenting certificates of prior fumigation		9

Port Angeles (*Wash.*) *subport.*—One sailing vessel was inspected and passed at this station.

Port Harford, Cal.—Acting Asst. Surg. C. J. McGovern reports as follows: Ninety-one steamers and 12 sailing vessels, carying 3,429 crew, were inspected during the fiscal year. No quarantinable disease was discovered.

Port Inglis (*Fla.*) *quarantine.*—Acting Asst. Surg. B. W. Burland in charge. During the year 13 steamers and 2 sailing vessels were spoken and passed; 13 steamers were inspected and passed. The steamers inspected carried 604 passengers and crew. Nine vessels were fumigated, yielding 116 rats.

Portland (*Me.*) *quarantine.*—Surg. H. S. Mathewson in charge. One hundred and forty-three steamers and 75 sailing vessels were inspected and passed. These vessels carried 8,778 passengers and 12,196 members of crew.

Three vessels from ports infected with plague were disinfected for the destruction of rats. Dead rats were collected from various parts of these vessels and autopsied, but no evidence of plague was found among them.

Port Townsend (*Wash.*) *quarantine and subports.*—Passed Asst. Surg. Baylis H. Earle in charge.

Three steamers were spoken and passed; 170 steamers were inspected and passed and 31 detained; and 56 sailing vessels were inspected and passed and 33 detained. The steamers carried a total of 16,601 members of crews and 14,162 passengers; and the sailing vessels a total of 1,166 members of crews and 33 passengers. Of the vessels detained 29 steamers, 20 schooners, 8 barks, 4 barkentines, and 1 ship were fumigated for the destruction of rats and other vermin; 2 steamers were fumigated for smallpox and the crew and steerage passengers of 1, numbering 63, were vaccinated; and the captain's quarters and sick bay on the United States Revenue Cutter *Tahoma* were fumigated, by request of the captain, having been occupied by a tubercular patient.

Providence, *R. I.*—Passed Asst. Surg. E. R. Marshall in charge:

Quarantine transactions.

Vessels entering quarantine	40
Vessels inspected and passed	35
Vessels inspected and detained	5
Total number of crew inspected	2,916
Total number of passengers inspected	18,605

The old steel Navy cruiser *Newark* is being fitted out for service at Providence as a floating quarantine station.

Philadelphia, *Pa.*—Senior Surg. Fairfax Irwin in charge (including Delaware River national quarantine stations).

Since March 16, 1913, the quarantine service of the Delaware River has been under charge of an officer stationed at Philadelphia, and the boarding and inspection of vessels has been continued at Marcus Hook in conjunction with officers of the State quarantine. The administration of the service from Philadelphia as a central point was considered best, as shipping agents would have easy access to the office in person. There have been numerous calls to make inquiry about the quarantine regulations, and telephone calls often amounting to as many as 20 daily. The inspection of vessels at Marcus Hook, thus doing away with a double inspection, has given great satisfaction, and the possible detention of vessels to be fumigated has lowered the time by at least one-half, owing to the use of carbon monoxide gas instead of sulphur. This gas is distributed by the Harker apparatus and its administration is simple, provided its danger to human beings is never forgotten. At Marcus Hook there have been stationed two medical officers of the service, who alternated in supervising disinfections, having a trained fumigator and crew to assist. The apparatus is located on the quarantine tug *Neptune*. In order to minimize the danger of carbon monoxide every hold and compartment of a vessel to be fumigated was thoroughly searched and closed. A red "danger" placard was pasted up. In addition the inspecting officer on boarding a vessel presented the captain with a typewritten statement of the method of fumigation his ship was to undergo and the special dangers attending the process.

The Delaware River quarantine has been well equipped for the care of ships and personnel detained, as well as for fumigations. The total bed capacity for persons detained at Delaware Breakwater, Reedy Island, and Marcus Hook is 3,197. In addition, plans have been drawn for additional barracks to be erected at Reedy Island.

Delaware Breakwater quarantine station.—This station, at the mouth of the Delaware Bay, was established by the National Government in 1884, and opened on the 1st of August of that year. The reservation has a water front of 1,500 feet and a depth of 1,200 feet, situated one-half mile from Cape Henlopen. About 900 feet west is an iron pier 1,701 feet long and a width that varies from 21 to 42 feet. The water at end of pier is 25 feet at mean low water. This pier is used for the landing of passengers during a quarantine.

The barracks are two in number, called the "north" and "south," and each has a length of 300 feet, a width of 24 feet, and a clear height of 12 feet. They are each divided by five partitions into compartments of equal size, and contain accommodations for 750 persons. The bunks are arranged in tiers, three in number, similar to those of a vessel. Each barrack has an addition, 15 by 44 feet, containing rooms for nurses, ships' officers, etc. The barracks are not connected, but in the interval between them is the building containing the mess hall, kitchen, and storerooms. This building is 48 by 48 feet, with a wing 18 by 45 feet. The kitchen contains apparatus for cooking by steam, and all modern appliances for the preparation of food. The mess hall will seat about 250 people at one time. In the rear of the barracks are found the latrines, wash rooms, and wash tubs for clothing.

The cabin-passenger building is 70 feet 6 inches by 39 feet 6 inches, and can accommodate from 100 to 150 persons, if necessary. It has a kitchen, dining room, toilets, baths, etc.

The immigrants or suspects' bath house is 86 by 16 feet, and contains 20 shower baths, with hot and cold water connections. It has dressing rooms at either end.

The boiler house and laundry contains the disinfecting chamber, which is 4 feet 4 inches by 5 feet 4 inches by 9 feet 6 inches, and has two cars. The cars run on a track and can go through from one end to the other. This chamber can be used with steam or with formaldehyde in vacuo, by means of a special apparatus.

The other buildings of the station are:

Surgeon's quarters, which has four bedrooms, two baths, and is steam heated.
Boathouse.
Flag house.
Stable.
Paint and oil house.
Men's hospital, 60 by 30 feet, 2 stories, having quarters for pharmacist, ward with 12 beds, bath, toilet, etc.
Women's hospital, 50 by 30 feet, having ward with 20 beds, bath, toilet, etc.
Contagious hospital, or ward; has 6 beds, kitchen, etc. Has high fence around it.
Disinfecting house for surface fumigation of baggage, etc. Used as a waiting room for those about to bathe under showers.
Blacksmith shop.
Cistern for rain water from roof of barracks; capacity, 45,000 gallons.
Cistern for rain water from roof of barracks; capacity, 20,000 gallons.

The water from the cisterns is pumped by an engine up into high tanks, which have a total capacity, when filled, of 48,000 gallons. The station has, also, a pipe connection with one of the factories near there, which in turn connects with the town of Lewes' water supply. This can be turned on at any time. There is a meter on the pipe to show amount used.

Crematory to destroy bodies.

There is an apparatus to boil the sewage before it leaves station should this be necessary.

There is telephone connection between the principal buildings.

All the buildings, except the surgeon's quarters, are heated by coal stoves.

The only system of lighting is by kerosene lamps.

There are four attendants employed as a regular force. They furnish their own subsistence.

Reedy Island quarantine station.—There are 18 buildings on the station, large and small, including the hulk *Lancaster* as a building, 5 of which are for the purpose of caring for persons in quarantine, as follows: Isolation hospital, size 53 feet by 34 feet 8 inches, 1 story, which is divided into 4 wards, nurse's room, dining room, kitchen, and storeroom. Capacity, 15 beds.

Crews detention building; size, 60 feet by 24 feet 8 inches, first floor; 48 feet 6 inches by 24 feet 8 inches, second floor. This is a two-story building, the first floor divided into kitchen, pantry, washroom, and toilet, and one sleeping compartment containing 72 iron standee bunks. The second floor divided into five sleeping rooms, laboratory, toilet, and hall sitting room. Capacity, 13 beds. Total capacity of this building, 85 beds.

Hospital building; size, 56 feet 8 inches by 27 feet 8 inches, divided into nurse's room, dispensary, kitchen, toilet and bath, and one ward. Capacity, 15 beds.

Wharfhouse; a two-story building; size, 94 by 23 feet. The first floor divided into four compartments—storeroom, shower baths, tank room, and two sleeping rooms for employees. The second floor is divided into five rooms equipped as barracks, with bunks for 34 persons.

The hulk *Lancaster* is equipped with 548 iron standee bunks, 80 double and triple deck iron beds, and 23 staterooms with single bunks. Capacity, 748.

The total sleeping capacity of the station at present is 897 persons.

The remaining buildings are the coal house; size, 37 feet 8 inches by 23 feet, used for the storage of coal. Paint and oil house; size, 18 feet by 7 feet 6 inches. Pump house; size, 12 feet by 12 feet. Storehouse; size, 30 feet 11 inches by 18 feet, used for storage of property. Laundry building; size, 20 feet 8 inches by 12 feet. Lumber storehouse; size, 19 feet by 27 feet. Carpenter shop; size, 30 feet by 18 feet. Attendants' quarters; size, 66 feet 9 inches by 23 feet. Medical officers' house; size, 40 feet by 40 feet. Boathouse; size, 50 feet by 28 feet. Gas house; size, 9 feet by 7 feet. Watchman's house; size, 8 feet by 8 feet. Fumigating, heating, and lighting building on wharf; size, 89 feet by 35 feet, which is divided into two compartments, containing two steam chambers and boiler, one heating and power boiler, one dynamo and engine, one steam pump, and one bichloride pump.

The new barracks, for which plans have been already drawn, will be a two-story building; size, 120 feet by 70 feet. The first floor divided into six sleeping compartments, 75 persons each, one compartment with 30 shower baths, 1 compartment for toilets and wash room, dining room, and kitchen. The second floor divided into eight sleeping compartments, 75 persons each, one compartment for toilets and wash room, one compartment for attendants and laboratory. Total capacity of building, 1,050 persons.

The difficulties of administration of the quarantine service of the Delaware River were very greatly increased by the removal of the steamer *Neptune* from commission for necessary annual repairs which usually require about a month's time. It has been suggested that a Harker apparatus installed upon a barge to be towed by a launch or provided with a small motor for moving from vessel to vessel would be more economical than a steam tug. In such case a large quarantine service, such as the Delaware River, might be supplied with two Harker machines so that no change in the method of fumigations would be necessary. The fumigation of vessels at dock is dangerous, difficult, and unsatisfactory. While awaiting fumigation and unloading, rat guards must be provided and vessels breasted off from dock. These regulations are difficult of enforcement and require daily inspections to make sure. In the docks where the light is poor at best, and where night work must often be done, the danger to employees from falls into open hatches is very much increased. All of this goes to show the importance of having all fumigations done at Marcus Hook.

Owing to the rapid disinfection carried out by the Harker apparatus, many requests from agents of out-going vessels for fumigations were received, so many that it was thought advisable to make a small charge for material used.

Summary of transactions at Marcus Hook Quarantine, Pa., for the fiscal year ending June 30, 1914.

	Number.
Sailing vessels inspected and passed	37
Sailing vessels fumigated (to kill rats)	31
Steam vessels inspected and passed	915
Steam vessel fumigated (to kill rats)	219
Crew on sailing vessels	539
Crew on steam vessels	46,140
Passengers on all vessels	56,206
Crew and passengers vaccinated	3,964
Cases of quarantinable diseases held at station during year (smallpox)	1
Crew detained for observation, because of exposure to smallpox (steamship *Koln*)	5
Passengers detained for observation because of exposure to smallpox (steamship *Koln*)	182
Crew detained because of suspected quarantinable disease (smallpox)	2
Steamer fumigated (partial) because of bacterial infection (smallpox, steamship *Koln*)	1
Steamers partially fumigated because of infectious diseases (measles, chicken pox, or scarlet fever)	4

These were Italian passenger vessels, via New York, and the compartments were fumigated at request of New York quarantine officer after all passengers were landed at this port. It is not customary to fumigate such compartments on vessels coming to Philadelphia direct. Nearly all vessels on which rats were destroyed were fumigated with carbon monoxide—only a few with sulphur dioxide.

The steerage compartments considered infected on the steamship *Koln* were fumigated with sulphur, 5 pounds to 1,000 cubic feet, for 24 hours. Passengers and crew taken from this vessel had their clothing and effects disinfected by steam.

The Italian passenger vessels mentioned above were disinfected by the formalin-potassium-permenganate method.

San Diego (Cal.) quarantine.—Acting Asst. Surg. W. W. McKay in charge. Three hundred and sixty-six vessels were inspected and passed; 4 vessels were fumigated. These vessels carried crews aggegating 8,341 and 3,883 passengers.

San Francisco (Cal.) quarantine.—Surg. M. W. Glover in charge. A total of 629 vessels was handled at quarantine during the fiscal year, and 85,660 persons inspected, of which 41,862 were passengers and 43,798 crew.

Summarized, the transactions were as follows:

Steam vessels inspected and passed	498
Sailing vessels inspected and passed	113
Steam vessels boarded and passed	14
Steam vessels spoken and passed	3
Steam vessels detained (smallpox)	1
Steam vessels fumigated (rodents)	191
Sailing vessels fumigated (rodents)	31
Steam vessels fumigated (smallpox)	1

The Pacific Mail steamship *Siberia* arrived March 29, 1914, with a case of smallpox in the Asiatic steerage, having notified the station prior to arrival of the presence of the case aboard. The case was discovered March 25, two days after leaving Honolulu, 16 days after the removal of another steerage passenger at Nagasaki quarantine for smallpox. The crew and second and third class passengers had been vaccinated at Yokohama. The case was isolated immediately on discovery, March 25, and all nontakes in crew and passengers revaccinated. On arrival at this port the cabin passengers were disembarked after inspection, and the contacts taken to the station, bathed, effects disinfected, and such as showed no evidence of recent successful vaccination were revaccinated. The steerage quarters of the vessel were fumigated with sulphur, 14 hours exposure. The case was isolated in the smallpox hospital on the station. He had three old vaccination scars, one on the right arm and two on the left.

In addition to the quarantine inspection on sailing vessels and smaller passenger vessels, the quarantine officers examined the personnel of such vessels for diseases and disabilities under the immigration law. The aliens detained at the immigration station were brought to the quarantine station and bathed and their effects disinfected at the request of the officer in charge of the medical division of the immigration station on March 2.

In accordance with bureau instructions the crews and steerage passengers of all vessels going to Alaska were inspected for recent vaccination marks, and those not showing scars were vaccinated. In all 6,307 were inspected and 1,230 were vaccinated.

Los Angeles and subports.—Senior Surg. S. D. Brooks in charge. This station includes three ports for quarantine inspection of vessels—San Pedro, Redondo, and Santa Barbara (including Gaviota).

Tranasactions.

Stations.	Steamers inspected.	Sailing vessels inspected.	Total vessels inspected.	Vessels fumigated.	Total passengers and crews inspected.
San Pedro	96	1	97	6	6,308
Santa Barbara	1	9	10		191

One case of smallpox was found on the American schooner *Alice Cooke*, from Aberdeen, Wash. The city of Los Angeles declined to admit the patient to its hospital, and the vessel was therefore remanded to the nearest United States quarantine station at San Diego.

Five of the vessels fumigated for destruction of rats were from Seattle and one from South American ports reporting existence of plague. Fumigation on other vessels from South America was deferred because of perishable cargo or because the holds were completely filled and was later accomplished at other ports on this coast. Rat guards were used on all such vessels and special precautions taken in watching for evidence of rats in cargo unloaded.

Savannah (Ga.) quarantine.—Acting Asst. Surg. William J. Linley in charge. One hundred and fifty-five vessels arrived during the year. One hundred and forty-nine steamships and six sailing vessers were inspected and passed. Crews inspected, 4,717; passengers, 19.

South Bend (Wash.) subport.—Acting Asst. Surg. Francis W. Anderson reports that 6 sailing vessels and 1 tug were inspected and passed.

St. Andrews (Fla.) quarantine.—Acting Asst. Surg. J. A. Wells in charge. Twenty-six vessels were inspected and 10 vessels fumigated. These vessels carried 347 members of crew and passengers.

St. Georges Sound quarantine.—Post-office and telegraphic address, Carrabelle, Fla. Acting Asst. Surg. B. B. Blount in charge. Twenty-eight vessels were inspected and passed and 14 vessels were fumigated. There were 261 members of crew and passengers on board these vessels.

St. Johns River quarantine.—Post-office and telegraphic address, Mayport, Fla. Acting Asst. Surg. Neil Alford in charge. Forty-five steamers and 58 sailing vessels were inspected and passed, 195 vessels were spoken and passed, and 9 vessels were fumigated. These vessels carried a total of 1,612 passengers and crew.

St. Josephs (Fla.) quarantine.—Acting Asst. Surg. B. S. Stutts in charge. Forty-three vessels were inspected during the year, carrying a total of 678 passengers and crew, and 10 vessels were fumigated.

Tampa Bay (Fla.) quarantine.—Post-office address, Fort De Soto, Fla. Telegraphic address, via Palmetto, Fla. Passed Asst. Surg. H. J. Warner in charge. One hundred and twenty-seven steamers and 85 sailing vessels were inspected and passed, 15 steamers were inspected and held, 41 steamers and 16 sailing vessels were fumigated and passed, and 8 steamers were fumigated and held. Ninety-four passengers and 6,119 members of crew were inspected. No quarantinable diseases were found on any of the vessels during the year.

Tacoma, Wash.—Acting Asst. Surg. F. J. Schug reports that 19 vessels from the west coast of South America were fumigated during the year.

TEXAS-MEXICAN BORDER INSPECTION.

El Paso, Tex.—Acting Asst. Surg. John W. Tappan reports the following:

During the past year by reason of disturbed conditions in Mexico no trains have crossed the international line at this port, passengers arriving in Juarez, Mexico, from interior points disembarking on the Mexican side. Those destined for the United States crossed the international bridges in the regular routine of traffic between El Paso and Juarez.

All immigrants and refugees were inspected at the immigration station in the usual manner and were required to present evidences of having had smallpox or a recent successful vaccination, otherwise to submit to vaccination before being allowed to enter the United States. There were performed during the fiscal year 1.000 vaccinations.

On account of the prevalence of typhus fever in Juarez and vicinity, no soiled laundry has been permitted to enter El Paso from Mexico, and, in conjunction with the State and city health authorities, a strict surveillance of the districts infected with typhus in Juarez has been maintained. There have been no cases reported in the city during the year, and the city health authorities state that there has been no typhus since the four cases reported in May, 1911.

Brownsville, Tex.—Acting Asst. Surg. G. D. Fairbanks reports as follows:

Passenger traffic has been almost suspended on account of conditions in the Republic of Mexico. Eighteen hundred and twenty-three aliens were examined for the immigration authorities, and five physical examinations made for the U. S. Life-Saving Service. One hundred and twenty-five vaccinations have been made in the last three months, and this work is being continued. A great many of the aliens show scars from successful vaccination, and as a rule these are allowed to pass.

Eagle Pass, Tex.—Acting Asst. Surg. Lea Hume reports that during the fiscal year ended June 30, 1914, 20,673 aliens were inspected, of which number 780 were certified for deportation by him. Among this number of immigrants, during October, 1913, there was a great rush to the American side of the Rio Grande. On the 6th of the month over 6,000 persons came to Eagle Pass seeking asylum. This vast body was placed under military guard and detained on the outskirts of the city.

On October 8 smallpox was discovered among the refugees, whereupon the medical officer placed the cases under quarantine and isolated them, maintaining a close watch on the main camp.

In all, 107 persons were cared for in the quarantine camp between the dates of October 8, 1913, and December 26, 1913, 39 of whom suffered with smallpox and four died. Some 2,500 persons were vaccinated.

Laredo, Tex.—Acting Asst. Surg. H. J. Hamilton reports that during the fiscal year 13,522 passengers were inspected.

RAT QUARANTINE.

GULF QUARANTINE.

There were 87 vessels fumigated, representing 55 per cent of all vessels entering quarantine, this being the same percentage as the previous year. The proportion of rats secured is practically the same as the previous year.

Attention is invited to the fumigation on November 26, which yielded 137 rats, the vessel being a bark of 1,080 tons. This was the largest catch of rats ever obtained at this station.

Dates of fumigations and number of rats found.

July	1	1	Nov.	15	3	Jan.	18	1
	8	4		15	4		19	10
	10	7		17	0		22	2
	10	4		19	0		26	0
	19	0		20	4		27	0
	25	4		22	0		27	4
	25	0		23	0		31	1
	26	0		23	0	Feb.	1	2
Aug.	1	0		26	137		11	2
	2	6	Dec.	3	0		12	0
	8	70		4	3		14	0
	14	6		5	21		20	0
	19	14		8	0		21	0
	28	8		12	7		23	16
	28	22		13	0		27	4
	28	13		14	0		28	0
	29	0		14	0	Mar.	1	0
Sept.	5	0		17	0		9	0
	17	2		18	0		10	31
	19	1		18	16		11	1
	28	2		20	1		11	0
	30	5		24	0		14	8
Oct.	2	33		26	4		19	3
	2	1		28	8	May	9	0
	12	0	Jan.	1	0		17	0
	17	4		3	0		26	35
	23	4		6	0	June	4	4
	29	9		9	0		16	0
Nov.	4	8		12	0		21	0

Total number of fumigations. 87. Total number of rats found, 550.

HAWAII.

At the Honolulu quarantine station 106 vessels were fumigated and 43 at Hilo for rat eradication, with a resulting yield of 113 rats, of which 32 were *Mus norvegicus*, 8 *Mus rattus*, 60 *Mus alexandrinus*, and 13 *Mus musculus*.

Owing to frequent fumigations and the proper observance of the rat guard requirements, the number of rodents on vessels has shown a remarkable diminution in the past few years, so that it is now very unusual for the master of a vessel to ask for fumigation on account of rodents; more often the request is made to rid the vessel of roaches. ants, and other vermin.

The vessels fumigated for the purpose of destroying rats on board were classified as follows:

1. Vessels from foreign ports.
2. Vessels bound for United States ports.
3. Vessels engaged in interisland trade.

1. Nine vessels from foreign ports were fumigated during the year with a resulting yield of 13 rats.

The decrease in the number of this class of vessels fumigated as compared with the previous year was due to the fact that the masters of vessels have learned the value of having their vessels fumigated at regular intervals, thereby frequently avoiding detention at ports of arrival.

The regular trans-Pacific liners were either fumigated at Hongkong or San Francisco at regular intervals, with the result that the great majority are practically rat free, but the sheathed vessels, as shown in last year's report, still continue to give a large rat yield at each fumigation, and is well illustrated by the following table:

Unsheathed.				Sheathed.			
Steamship Korea.		Steamship Siberia.		Steamship Chiyo Maru.		Steamship Tenyo Maru.	
Oct. 25,1913	0	Aug. 20,1913	24	Aug. 2,1913	23	July 12,1913	58
Jan. 10,1914	0	Nov. 5,1913	38	Oct. 13,1913	34	July 22,1913	68
Mar. 25,1914	0	Dec. 14,1913	0	Trapped Dec.,1913, to Jan. 10,1914	16	Trapped July 22, 1913, to Sept. 22, 1913	18
June 16,1914	0	Feb. 5,1914	3	Jan. 21,1914	112	Oct. 3, 1913	19
		Mar. 29,1914	1	Apr. 7,1914	19	Nov. 7, 1913	16
				May 15,1914	32	Trapped Nov. 1, 1913, to Jan. 13, 1914	75
						Jan. 13, 1914	5
						Mar. 20, 1914	20
						Trapped Mar. 20, 1914, to Apr. 24, 1914	35
Total	0		66		236		314

2. Vessels bound for United States ports.

The local liners plying between the islands and mainland ports were fumigated at either San Francisco or Seattle and are fairly rat free, for only 312 rats and 197 mice were obtained from 9 vessels as a result of 28 fumigations.

Thirty-eight sailing vessels carrying lumber from mainland ports were fumigated prior to departure from Honolulu and Hilo, with a resulting yield of 49 rats and 2 mice.

3. Vessels engaged in the interisland trade.

The interisland vessels were fumigated regularly throughout the year, those plying to the island of Hawaii were fumigated every 30 days, owing to the presence of plague on that island, while those vessels running to the other islands were only fumigated every three months.

Nineteen vessels are engaged in this trade, and they were fumigated 110 times, with a resulting yield of 36 rats and 11 mice. This is a reduction in the number of rats as compared with the preceding year and shows that they are practically free of rats and renders the transshipping of their cargoes to mainland steamers a safe procedure.

MOBILE QUARANTINE.

Of the 663 vessels entering quarantine 190 were fumigated, a percentage of 28.6. On these 190 vessels a rat yield of 1,130 was obtained—an average of 5.9 to each vessel treated. While this proportion is not as high as at some other ports it closely approximates the yield at the remaining Gulf stations where lumber vessels make up a large percentage of those exposed, and where systematic fumigation is the rule. It must not be supposed that the benefits of fumigation are to be measured by the number of rodents found subsequent to treatment; in many instances it was altogether impracticable to search for them without serious delay to the ship, hence in such cases none are recorded, while in others the search was inadequate.

It is interesting to note the average rat yield for the various types of vessel, and the following table indicates this:

Average rat yield:	
Schooners	1.4
Square riggers	6.2
Steamers	10.6

The easiest way to explain this difference is on the ground of tonnage—the larger the vessel the greater number of rodents it is apt to harbor; but this is not always the case, and in this instance the low average on schooners is doubtless due to the fact that they are subject to regular fumigation. The remaining sailing vessels and steamers are less seldom treated, consequently the count is larger.

During the past year it has been noticed at Mobile quarantine that the average rat yield per vessel has varied from month to month in accordance with the following table:

January	1.9	July	3.8
February	4.1	August	3.9
March	10.4	September	7.4
April	7	October	3.1
May	12.2	November	5.2
June	13.8	December	1.9

Whether this seasonal prevalence has been noticed at other stations or not has not been reported, and an observation over a period of several years would be necessary to determine if it is a normal condition or not.

SAN FRANCISCO, CAL.

A slight increase in the number of vessels fumigated for rodents over last year was noted, due to the occurrence of rat plague in Seattle, Wash.

Material assistance was rendered this station by the medical officer in charge of plague operations in San Francisco. Through his cooperation a careful supervision of rat guards on vessels, inspection of freight, and the searching of vessels after fumigation was accomplished.

A total of 222 vessels was fumigated for rodents and 2,716 of these vermin killed. It is interesting to note that only three *Mus norvegicus* were identified, while 1,602 *Mus alexandrinus* and 700 *Mus rattus* were found with 234 *Mus musculus*. On 82 of the vessels fumigated no rodents were found, while 30 vessels were not searched, owing to early departure or having cargo aboard. There were 157 vessels arriving from plague ports with certificates of fumigation at the port of departure.

PHILIPPINE ISLANDS.

The efforts of the service continued unabated during the year to keep both foreign and domestic vessels free of animals that might transmit disease. With this end in view there was fumigated 561 vessels. In carrying out this work the following animals are known to have been killed:

Animals destroyed.	Manila.	Cebu.	Iloilo.
Rats	1,354	237	115
Mice	460	124	42
Cats	3		1
Lizards	42		12
Scorpions	1		
Quarts of roaches	693	768	44
Quarts of ants	148	132	10
Gekkos (large lizards)	2		
Large spiders	15		12
Centipedes	140	11	63

There were 282 rats and 8 mice examined at the laboratory to determine whether they were plague infected, with negative results.

The question of destroying rats in cargo is of the greatest public health importance, but so far no satisfactory solution has been offered. It is the principal source of danger that must be guarded against in preventing the introduction of plague. During the severe plague epidemic on the China coast this year circulars were issued printed in Chinese advising the shippers that the cargo had been packed in plague centers and recommending careful unpacking of all loosely packed cases and other containers to ascertain if any rats were imprisoned therein, and that if any animals were discovered that they be immediately killed and held for examination. This work was carried out fairly well by the importers. It is suggested that goods packed in plague centers or shipped from such places be labeled so as to call the unpacker's attention to the fact that the same may harbor plague-infected rats, fleas, or other small animals. Experiments made with rats imprisoned in crates of potatoes placed in the hold of vessels, and fumigation with sulphur, resulted in the death of the rats in each instance. Experiments along this line will be continued. An effort has also been made to require the use of rat-proof containers. Conferences had with importers of vegetables showed that the rat-proof containers so far available are too expensive for their use. The greatest danger seems to be from cargo, such as bottles, lamp chimneys, etc., which is packed in loose straw, the rats getting into the containers after packing is discontinued for the day and a partly filled receptacle is left to be finished the next day, when the imprisoned rat is shipped abroad with the cargo, to escape in the warehouse where unpacking is done.

INSULAR QUARANTINE.

OPERATIONS OF THE SERVICE IN THE PHILIPPINE ISLANDS.

Surg. Victor G. Heiser has continued to serve throughout the year as chief quarantine officer of the Philippine Islands.

QUARANTINE EXPERIENCE.

The operation of a quarantine service in the Orient in the very midst of the world's great infected centers of quarantinable disease, under the quarantine laws and regulations of the United States, with the necessary machinery for giving them practical effect, affords an unparalelled opportunity quickly to test the effectiveness of the measures which are prescribed. A brief review of that experience shows that with a minimum amount of disturbance to commerce the Philippines can be protected against the invasion of such diseases. Stool examinations for cholera vibrios have proved more effective than quarantine detention; antirat measures on vessels, constantly applied, have kept plague under control in spite of the fact that it is frequently brought to the doors of the Philippines; the insistence upon vaccination of the personnel of all vessels has made smallpox almost a negligible factor.

SCOPE OF SERVICE ACTIVITIES.

The duties of the service in the Philippines may be divided as follows: 1, Incoming, domestic national quarantine; 2, Outgoing, or consular quarantine; 3, Immigrant medical inspection; 4, Physical examination of masters, mates, and engineers in the Philippine coastwise trade; 5, Inspection of sanitary conditions of interisland vessels; 6, Inspection of meat and meat food products under the food and drugs act, and other miscellaneous duties.

THE PORTS OF THE PHILIPPINES.

The ports of entry of the Philippine Islands are Manila, Cebu, Iloilo, Zamboanga, Jolo, Cavite, and Olongapo. One or more service officers are stationed at each of these ports. In addition there are maintained modern quarantine stations at Manila and Cebu, to which vessels may be remanded that require additional treatment after inspection is completed.

SANITARY MAINTENANCE OF VESSELS.

The sanitary maintenance of vessels is a service which is performed under authority of insular laws, and its object is to promote the safety and comfort of the traveling public and of the crews that are employed on such vessels. In many respects this branch of sanitation is far in advance of that which has been attempted in other parts of the world. Briefly, the requirements are as follows: That only distilled or sterilized water shall be issued to passengers or crews of vessels for drinking purposes. In order to enforce this provision, samples of water are collected from time to time and sent to the laboratory for analysis. If amoebæ are found, it is considered prima facie evidence that the water is contaminated, and if there are repeated violations in this regard fines are imposed. At the end of each voyage the drinking-water tanks are emptied and thoroughly treated with live steam before they are refilled. Galleys, or places where food is prepared, shall be located as far as possible from all water-closets or urinals, and no garbage or other waste material shall be permitted to collect either in receptacles or on the decks or in or about the galleys. Garbage chutes must be kept rigorously clean. Ice boxes must be emptied and thoroughly cleansed with boiling water at least once weekly, and at the end of each voyage they must be washed with a solution of permanganate of potassium of a strength of 1 to 3,000. All decks must be washed down with sand and water daily. There must be an adequate supply of linen, tablecloths, napkins, etc. Cooking and table utensils must be washed in boiling water. Bed linen, toilet articles, and other equipment in staterooms and steerage must be of standard quality and be kept scrupulously clean. There must be an adequate number of toilets with separate toilet accommodations for crew, cabin, and steerage passengers. They must be kept free from odors by the application of a suitable disinfectant. Each vessel must have suitable bathing facilities for all classes of passengers. Cooks, stewards, and other persons engaged in preparing or serving food must be examined prior to employment and be free from dangerous communicable diseases. Expectoration on decks or other parts of the vessel is prohibited. Masters of vessels are required to make a daily inspection in order to satisfy themselves that the foregoing sanitary regulations are faithfully enforced. Vessels in all ports of entry in the Philippines are required immediately to report any case of sickness of whatsoever nature to the quarantine officer. By the enforcement of this rule cases of quarantinable disease are detected from time to time, and thus another safeguard is had against the introduction of quarantinable disease.

CHOLERA.

Surg. Heiser reports that the experience with cholera during the year has developed a number of points that are of much interest from a quarantine standpoint. As cholera increased in the Philippines, steerage passengers from oriental foreign ports began to show an increased number of vibrios of different types in their stools. The laboratory workers of the bureau of science state that there was a close relationship between the number of vibrios found among steerage passengers and the height of the disease in the Philippines. In other words, as the number of cases began to increase, an increased number of vibrios was found in the stools of steerage passengers, and coincident with the subsidence of cholera in the Philippines the vibrios gradually began to disappear from the stools of the steerage passengers. Except as stated below these vibrios, however, could not be identified as cholera vibrios. The bills of health during this period did not show that cholera was present at the port from which the steerage passengers came, but as information in the Orient is frequently lacking as to the actual conditions that exist in near-by places to those from which vessels sail, it is not unlikely that cholera may have prevailed in sections from which steerage passengers were recruited.

One cholera vibrio carrier was found on the steamship *Eizaguierre* August 25, 1913, in a steerage passenger who embarked at Singapore. Another case was detected on the steamship *Chicago Maru* January 9, 1914, in a Japanese woman who embarked at Kobe.

There is still much evidence to show that in all probability the outbreak of cholera which began in the Philippines August 24, 1913, was not introduced by persons from the outside. In other words, as stated by Surg. Heiser, it appears likely that cholera carriers are more or less constantly present in the Philippines.

The last case of cholera reported in the Philippines was March 21, 1914. The total number of cases in Manila was 210, with 137 deaths. The total number of cases in the Provinces was 698, with 510 deaths.

This is the first time in the history of the Philippines that an outbreak of cholera was held down to such small proportions, and the success of the campaign was no doubt largely due to the educational work which has been done during the past 10 years. It was almost the invariable rule whenever the first case of cholera appeared in a town that if it was promptly reported and proper measures against it were carried out no further spread took place. Briefly, the success of the anticholera measures was largely due to the cooperation which the bureau of health received from the public. This view is further supported by the fact that in Capiz Province, where the residents were opposed to the measures which were instituted by the bureau of health, cholera spread rapidly; and it was not until a threat was made to withdraw from the territory and the bureau finally received the cooperation of the residents of Capiz Province that the diseases came under control.

Another noteworthy feature was the simplicity of the measures employed. No regular quarantines were instituted. No maritime quarantine detention was imposed upon vessels. Reliance was placed principally upon the detection of cholera vibrios in the stools of passengers from suspected ports. On land no quarantine was imposed beyond the isolation of the sick. Vigorous efforts were made to disinfect the stools and vomited matter of the sick and for the proper disposal of the human excrement of all the residents in towns in which cholera appeared. Cholera often appeared in towns in which no connection with the previous cases could possibly be traced, and it was not an infrequent experience to find cholera vibrios among residents of towns in which no cholera appeared later. In brief, the whole experience of this outbreak shows the desirability of further laboratory studies being made with regard to this disease.

CEREBROSPINAL MENINGITIS.

During the early years of American occupation (1899–1900), cerebrospinal meningitis was reported. No further cases then came under observation until September, 1912, when a case was discovered at the Mary J. Johnston Hospital in Manila. The disease, however, never assumed epidemic proportions until it made its appearance in a railroad camp at Laguimanoc, a barrio of the municipality of Atimonan, Tayabas Province, where between June 23 and November 17, 1913, 17 cases occurred. The first persons affected were laborers who had been recruited in Cebu Province. An investigation made in that Province failed to show any cases of the disease. In view of the fact that a number of experienced laborers from Italy were employed, it is possible that a carrier might have existed among them and the disease introduced into the Philippines in that way. It is also possible that the laborers may have become infected in Manila during the time that they were en route to Laguimanoc. The measures to eradicate the disease were successful and no further cases have been reported.

HOOKWORM AND OTHER INTESTINAL PARASITES.

The routine stool examinations which are made for cholera carriers of all steerage passengers arriving from oriental ports afford an excellent opportunity to ascertain the percentage of hookworm and other intestinal parasites which exist among them. During the year there were 6,776 such examinations made, of which 2,340 showed some form of parasite. Of the total number, 1,768, or 26.1 per cent, contained ascaris; 933, or 13.8 per cent, trichuris; and 198, or 2.92 per cent, contained hookworm; 463 specimens contained ascaris and trichuris; 48 specimens contained ascaris and hookworm; 27 specimens contained trichuris and hookworm; and 26 specimens contained ascaris, trichuris, and hookworm.

LEPROSY.

Leprosy was present on 14 vessels that arrived at Philippine ports during the year. There were 22 vessels disinfected either wholly or in part on account of having lepers on board. The coast guard cutters that are employed by the Bureau of Health for conveying lepers to the Culion Leper Colony were disinfected and fumigated at the Mariveles quarantine station.

This office assisted the Bureau of Health on numerous occasions by furnishing transportation to the ports of entry for lepers from near-by ports.

MEASLES.

Measles still continues to be a most serious disease from a quarantine standpoint. Seven vessels from the United States arrived with measles on board; of these five were United States Army transports. The mutual arrangement, which was mentioned in the last annual report, which exists between the Army and this service for handling infected vessels, was continued in effect. It is impossible accurately to judge of its merits because infection introduced during previous years still persists. The records of the Bureau of Health show that for the year ended December 31, 1913, there were 1,341 deaths in the Philippine Islands. No deaths were reported in Manila.

There still remains evidence to show that measles infection in the Provinces gradually becomes milder and milder, and that severe outbreaks only occur when a more severe strain of the disease is introduced from another country.

PLAGUE.

The Philippines have been most seriously menaced by plague from near-by foreign ports. One vessel from Hongkong and three vessels from Amoy had plague on board on arrival or developed plague among the passengers or crew within the incubation period of the disease after arrival in the Philippines. On account of the fact that a few sporadic cases of plague still continue to occur in Manila and on account of the fact that the manner of the spread of the disease is now so well understood, it is not deemed necessary to place actual quarantine detention on vessels from plague-infected ports, even though they did arrive within the incubation period of the disease. Reliance was placed upon a double-quarantine inspection; that is, careful physical examinations that were made, which includes taking of temperatures first at the Mariveles quarantine station and the fumigation of all holds, storerooms, steerage quarters, and other closed spaces which were liable to harbor rats or fleas. Upon the completion of this work the vessels were permitted to proceed to Manila, where another careful inspection was made, including the taking of temperatures of all on board. If everything was well up to this point, the vessels were released. The names and addresses of all passengers were taken, and if there were any suspicious circumstances the passengers were required to report daily for one week to one of the health stations of the Bureau of Health. Cases having fever which could not be satisfactorily explained were kept under observation at San Lazaro Hospital. One case of plague developed among such suspects from the steamship *Linan*, which arrived in Manila May 23, 1914. Another case of plague was found in the city of May 17, at 2 p. m., after the passengers from the steamship *Taisang* had landed earlier in the day.

Briefly, it is believed that the foregoing procedure, in spite of the great danger present, adequately protects the Philippines against the introduction of plague, and at the same time causes the minimum disturbance to the public and to the shipping interests.

SMALLPOX.

Two cases of smallpox occurred on the steamship *Tacoma Maru*, which arrived at Manila on August 20, 1913. An occasional case of varioloid occurred on interisland vessels, but owing to the complete vaccination which has been enforced by the service of all crews in interisland trade there was no spread of the disease. There has been no death from smallpox in Manila since June, 1909, a period of more than five years.

TYPHUS FEVER.

A number of cases resembling typhus fever were reported from the Philippine General Hospital in Manila, but there is still much difference of opinion among medical men as to whether these cases were real typhus. The laboratory work was not productive of satisfactory results. A diligent search has been made for the pediculus vestimenti, but with negative results. As the pediculus vestimenti is, so far as is known, the only intermediate host of typhus fever, the physicians in charge and those called in consultation deemed the findings insufficient to warrant reporting them as positive typhus fever. On account of the fact that all steerage passengers bound for the Philippines that arrive within the incubation period of the disease are either bathed and carefully examined physically at the ports of embarkation or at the ports of arrival, and since no cases suspicious of typhus fever were detected, it is not believed that this disease is an important public-health element at this time in the Philippine Islands.

PANAMA CANAL.

Surg. Heiser suggests that in addition to the serious danger which constantly threatens the Philippines on account of their close proximity to thickly populated centers in which quarantinable disease is always more or less present in epidemic form, there will be the additional menace of yellow fever being conveyed by vessels that pass through the Panama Canal. While it is not likely that yellow fever will exist to any appreciable extent in the Canal Zone, yet its presence in contiguous territory and at ports of call at which such vessels are likely to stop constitutes a source of danger to the Philippines. The introduction of yellow fever into the Philippines would be a great calamity because of the presence and very wide distribution of a mosquito, which apparently is the same as the one which acts as the intermediate host in other countries. The *Aedes* (Stegomyia) *calopus* has been greatly reduced in numbers by the antimosquito campaign which has been conducted in Manila during the past few years, but when these efforts are slightly relaxed they soon reappear in large numbers.

BUILDINGS AND EQUIPMENT.

During the year there was completed at the Mariveles quarantine station, at a cost of $51,470.14, a reinforced concrete wharf 325 feet long by 40 feet wide on which was erected a steel disinfecting building. This wharf ranks as one of the most modern and permanent wharves that exist anywhere in the world today, either for commercial or for other purposes.

A contract was let for the construction of an administration and disinfecting building at the Cebu quarantine station, which is to cost $5,500.

The sum of $4,750 which was available for the construction of a disinfecting building at Iloilo was reverted to the Treasury because a satisfactory title to the land upon which it is proposed to erect the building could probably not be secured for a year or more.

At Mariveles at the close of the year a reinforced concrete barrack building, divided into two distinct units for the accommodation of 300 steerage passengers, was about half completed.

On account of the urgent necessity for economy, the sum of $12,500 which was available for a new boarding launch for Manila was reverted to the Treasury and instead there was appropriated $3,000 for rebuilding the launch *Zapote*, which has been used as a boarding launch in Manila since 1900.

In addition to the foregoing, extensive repairs have been made to the quarantine buildings, launches, and other equipment, so that the service property is in good condition or in process of being put into good condition. The disinfecting barge at Iloilo deteriorated so rapidly that it was necessary to have it condemned and sold. At the present time it is only possible to use Iloilo as an inspection station. Infected vessels requiring extensive treatment have to be remanded to Cebu or to Manila.

AID TO OTHER SERVICES.

Direct aid was extended to the following services: Bureau of Agriculture, disinfection of vessels suspected of being infected with cattle diseases; bureau of health, disinfection of vessels carrying lepers; sanitation of interisland vessels, use of water transportation, etc.; bureau of customs, examination of immigrants, medical service for detained immigrants, physical examinations of officers of interisland vessels, etc.; board of food and drug inspection, examination of meat and meat products on incoming vessels (this involved an enormous amount of time); Philippine civil service, making physical examinations of candidates in disputed cases and the rating of medical and pharmaceutical examination papers; Nautical School, physical examination of applicants; foreign consular services, preparation of bills of health and furnishing of other data; United States Army, assistance in dealing with minor quarantinable diseases, fumigation of vessels, sanitary inspections, and furnishing plans for sanitary installation at Corregidor; United States Coast and Geodetic Survey, fumigation of vessels for vermin and sanitary inspections; Weather Bureau, displaying of typhoon signals and recording meteorological data.

GARBAGE OF VESSELS IN PORT.

Considerable progress was made in enforcing the regulations against garbage of vessels in port being thrown overboard. Garbage furnishes food for the rats along the water front, and since it has been greatly reduced in amount, it has been possible to exterminate the rats almost entirely.

RAT-PROOF PIERS.

The type of rat-proof construction used in the new piers has proved entirely successful. These piers have now been used for over five years and it has been possible to keep them entriely free from rats. It not infrequently happens that a few rats escape from cargo which is placed upon the piers, but on account of the fact that they are unable to reach the shore it becomes a comparatively simple matter for the cats which are constantly present on the piers to catch these rats.

CURRENT APPROPRIATION BILL EXPENDITURES.

The legislature appropriated for the service in the Philippine Islands $61,137, which is in round numbers $6,000 less than has been appropriated during previous years. The fiscal year has been changed from July 1 to June 30, to January 1 to December 31, so that it is somewhat difficult to draw accurate comparisons. For the fiscal year ended June 30, however, there was available $65,268.77, of which $57,193 was expended for salaries, wages, and contingent expenses and the sum of $2,500 was used for public works and permanent improvements. On account of the fact that most of the buildings of the service are being gradually replaced by reinforced concrete structures, thereby eliminating the constant item of repair, it is becoming more and more possible to operate the service for a lesser expenditure in this respect than has been the case in the past.

CONSULAR QUARANTINE.

The growing commerce between the Philippines and the United States has increased the consular quarantine work even in greater proportion, the number of small shipments having almost quadrupled. The issuing of consular bills of health and the carrying out of the varied regulations covering the passengers and cargo, as well as the vessels, requires of the service in the Philippines an amount of work the enormity of which can only be appreciated by those who have been in actual charge of such operations. From December, 1913, until May, 1914, all steerage passengers leaving for the United States or the Hawaiian Islands were required to have their stools examined to determine whether they were free from cholera organisms.

The transactions of the year are shown as follows:

Bills of health issued	481
Crew inspected	26, 037
Passengers inspected	19, 132
Pieces of cargo inspected and certified	1, 455, 239
Vessels inspected	133
Vessels disinfected and fumigated	39

CAVITE AND OLONGAPO.

Vessels of the Navy, or consigned to the Navy, arrived at both Cavite and Olongapo during the year and were inspected and treated in accordance with the regulations. The quarantine officers in charge are surgeons of the United States Navy detailed to act as such by the admiral in command of the Asiatic Fleet.

A plague-infected rat was reported to have been found at Olongapo on a lighter used for discharging cargo from vessels. A vigorous anti-rat campaign and thorough fumigation of all the vessels in the port of Olongapo showed a general and rather excessive rat infestation ashore and aboard the ships. Three weeks' active work failed to find an additional infected rat. No infected vessels arrived at these ports and consequently no disinfections were necessary.

The statistics for the year are as follows:

Vessels inspected	8
Crew inspected	861
Passengers inspected	48
Bills of health issued	6

MANILA.

The following table shows figures for some of the transactions on Manila Bay and the quarantine office in the city of Manila, and does not include the work done at Mariveles, which is the disinfection and detention station for the port of Manila:

Arriving vessels inspected	725
Bills of health issued	847
Passengers inspected	41, 359
Crew inspected	63, 917
Pieces of cargo certified	1, 197, 420
Vessels disinfected or fumigated	290
Rats examined for plague	268
Stools examined for cholera carriers	6, 776
Stools examined for hook worm	1, 204
Persons vaccinated	8, 047
Aliens medically inspected	3, 056
Physical examinations made	282
Cattle-carrying vessels disinfected	17
Vessels inspected in port	1, 104
Meat certificates viséed	8, 723

MARIVELES QUARANTINE STATION.

The Mariveles quarantine station maintained its previous record for efficiency and for the volume of work accomplished. Altogether 85 vessels, with a total of 4,241 crew and 3,623 passengers, called and were given appropriate treatment. Pratique was granted to 33 vessels which called only for inspection; 5 vessels called for the purpose of undergoing special measures on account of plague, 2 vessels on account of having smallpox on board, and 24 vessels for fumigation or disinfection. A number of vessels seeing that they could not arrive at Manila before sunset called at Mariveles and were granted pratique so as to be able to work cargo at Manila the same night on which they arrived. This procedure was discontinued at the request of the insular collector of customs, and now pratique in similar cases is not granted at Mariveles. At the opening of the fiscal year there were 13 persons in quarantine from the preceding year under observation on account of plague; 61 additional persons entered quarantine at this station during the year on account of 2 cases suspicious of plague, 3 cases of measles, and 1 case of smallpox which were on arriving vessels. All these persons were subsequently released except one who died, the cause being intestinal obstruction. No persons remained in quarantine at the close of this fiscal year.

The vessels bringing cattle from Australia to Sisiman were also inspected and cleared at Mariveles. Some interesting experiments were made with said vessels to rid them of flies after arrival, and later to prevent their arrival with flies aboard on subsequent voyages, with the result that after the measures prescribed were carried out the vessels arrived almost flyless. Quite a number of patients were treated in the station hospital for more or less extended periods, including 1 case of smallpox, 3 cases of measles, and other general diseases. One autopsy was performed. There were 3,247 vaccinations performed at the station.

The free dispensary for the benefit of the poor of the village of Mariveles and contiguous territory was maintained and kept open every day during the year. There were 4,064 treatments at the dispensary on the quarantine reservation and many calls were made at the homes of those too sick to come to the station.

The entire population of the village of Mariveles was treated with quinine as a prophylactic measure covering a considerable period in order to eradicate malaria. A full report of the results is not available.

The following table serves in a measure to show part of the transactions at the Mariveles station:

Vessels at station	85
Vessels disinfected and fumigated	24
Crew bathed and effects disinfected	188
Passengers bathed and effects disinfected	130
Pieces of baggage disinfected	264
Persons vaccinated	3, 247
Number of days persons in quarantine	479
Crew inspected	4, 241
Passengers inspected	3, 623

ILOILO.

At Iloilo a greater amount of quarantine work was performed during this period than for some years. No quarantinable diseases were detected on arriving vessels, but as many of the vessels arrive from badly infected ports, the greatest care was necessary and the most rigid measures had to be adopted to protect Iloilo and the Philippines. All the vessels in the interisland trade were given their semiannual fumigation. Owing to the constant vigilance maintained in reference to vessels fending off and wearing rat guards, the number of rats obtained at the fumigations has appreciably diminished. Cholera being present in Manila and Capiz Province, special inspections were made of all vessels arriving at Iloilo from the infected centers. The general health of the port has been good, and considerable has been accomplished during the year in improving the sanitary condition of the city. Foreign vessels come up the river into the center of the city and moor at the quays. There were physically examined 94 applicants for licenses as officers on vessels and 317 arriving aliens. The disinfecting barge formerly in service at this station was sold, and the disinfecting plants stored. Iloilo is now without steam disinfection facilities, and should a vessel require extensive treatment it would be necessary to remand same to Mariveles or Cebu. The quarantine launch was thoroughly overhauled and repaired, and the station property is in excellent condition.

The statistics for the year at Iloilo are as follows:

Vessels inspected	219
Vessels disinfected or fumigated	225
Crews inspected	14, 248
Passengers inspected	8, 907
Persons vaccinated	87
Bills of health issued	411

CEBU.

Cebu is both an inspection and detention station. The vessels are boarded in Cebu Harbor. The quarantine station is located on the near-by island of Cauit, which also serves as the headquarters of the service. For the convenience of the shipping interests an office in the customhouse is kept open several hours each day. In addition to the inspection of vessels arriving from foreign ports and the inspection of vessels bound to the United States, a special inspection was made of such vessels as arrived from cholera-infected ports in the Philippines. Three vessels were disinfected on account of quarantinable disease aboard, one with a case of smallpox and two vessels from Hongkong which had plague occur during the voyage. One of the cases of plague was treated in the hospital on the quarantine station and recovered, and was discharged the thirtieth day after his admission. The case of smallpox was also treated at the quarantine station, and made a successful recovery. Asst. Surg. Louis Schwartz was in charge of the Cebu station during the year, and in addition thereto conducted the eye, ear, nose, and throat free clinic at the Southern Islands Hospital.

Vigorous measures were continued throughout the year to prevent the introduction of plague rats from vessels moored at the quays. All vessels in the interisland trade were fumigated once each six months, and a number of large ocean-going steamers had their fumigation done at Cebu before loading for America. In carrying out this work there were 66 vessels fumigated, from 64 of which there were recovered 237 rats, 124 mice, 300 liters of roaches, besides other insects. No noticeable diminution was observed in the number of rats found on vessels fumigated over the figures for former years. There were 103 arriving aliens inspected, and 34 seamen were physically examined and certificates issued as part of their application for license as ship's officers on American vessels. The damage occasioned by the typhoon of October, 1912, has now been repaired. The two new breakwaters, on which some work was done throughout the year, are now completed; 200 additional trees were planted, and the buildings on the station were maintained in good condition.

The statistics for the year at Cebu were as follows:

Vessels inspected	281
Vessels disinfected or fumigated	68
Crew inspected	16,779
Passengers inspected	6,850
Persons vaccinated	27
Bills of health issued	149

JOLO AND ZAMBOANGA.

At Jolo and Zamboanga, as heretofore, the quarantine work was conducted by an officer of the United States Army detailed as quarantine officer of the port. Only such vessels as arrived directly from foreign ports were inspected, except during the presence of cholera in Manila, when vessels from Manila were also inspected for the protection of the southern cities. The immigrant medical inspections were made, and the general quarantine laws and regulations were carried out. The wharf at Jolo has been rat-proofed, which is a great protection, because both foreign and interisland vessels go to the same wharf.

The ports of Zamboanga and Jolo are most important from a quarantine standpoint, even in view of the fact that a large number of vessels do not arrive there from foreign ports, because plague and cholera are almost continually present in the near-by ports of Borneo and the Straits Settlements, and on account of the fact that some of these infected centers are but a few hours' steaming time from the southern points of the Philippines. The danger of introducing quarantinable disease is present the year round. No special equipment has been provided for either of these ports, and the cost of maintaining the inspection service is quite reasonable.

The statistics for the year at Jolo were as follows:

Vessels inspected	62
Bills of health issued	30
Crew inspected	4,229
Passengers inspected	2,924

The statistics for the year at Zamboanga were as follows:

Vessels inspected	17
Bills of health issued	17
Crew inspected	1,160
Passengers inspected	708

PERSONNEL.

The quarantine service in the Philippines is conducted by the United States Public Health Service and is administered by a surgeon bearing the title of chief quarantine officer, who also acts as the quarantine officer of the port of Manila, and 4 commissioned and 5 acting assistant surgeons, of whom 2 are in Manila, 1 at Mariveles, and 1 at each port of entry. The present chief quarantine officer, Surg. Victor G. Heiser, continued to act also as director of health, which position placed him in charge of the entire sanitary and medical work of the Philippine Government, including the administration of all the Government general and dangerous and contagious disease hospitals throughout the islands.

Statistics of incoming national quarantine.

Port.	Steamers inspected.	Sail vessels inspected.	Total vessels inspected.	Vessels quarantined.	Vessels fumigated and disinfected.	Total passengers and crew inspected.
Manila	724	1	725	10	....	105,276
Cavite and Olongapo	8	0	8	0	0	909
Iloilo	218	1	219	0	225	23,155
Cebu	281	0	281	3	69	23,629
Zamboanga	17	0	17	0	0	1,868
Jolo	61	1	62	0	0	7,153

OPERATIONS OF THE SERVICE IN PORTO RICO.

Service operations in Porto Rico for the fiscal year ended June 30, 1914, embraced quarantine, marine hospital relief, medical inspection of immigrants, plague eradication, and miscellaneous duties.

The service maintains quarantine stations at San Juan, Ponce, Mayaguez, Arecibo, Aguadilla, Fajardo, Humacao, Guanica, and Jobos (Aguirre). Immigration inspection is done at all these ports, but marine hospital relief is furnished only at San Juan and Ponce.

Quarantine is the most important phase of the service operations in Porto Rico. The medical officer in charge at San Juan is chief quarantine officer for Porto Rico and has under his supervision and direction all quarantine matters at the other ports. At San Juan is maintained the only quarantine station in Porto Rico, located on Miraflores Island in San Juan Bay. It is equipped with quarters for noncommissioned officers and attendants, detention quarters, disinfecting and fumigating apparatus, etc. An office is maintained in San Juan.

At Ponce there is a fumigating barge on which can be accommodated a small number of persons detained for observation. At the other ports inspection stations only are maintained.

QUARANTINE.

Personnel—*San Juan.*—Chief quarantine officer, Passed Asst. Surg. R. H. Creel, July 1–September 3; Surg. W. W. King, September 4–June 30; Passed Asst. Surg. C. W. Chapin (in charge of plague laboratory, July 1–Oct. 31); Acting Asst. Surg. Pedro del Valle Atiles; Pharmacist B. E. Holsendorf.

Ponce.—Acting Asst. Surg. Julio Ferrer Torres.

Mayaguez.—Acting Asst. Surg. R. U. Lange Miranda and one office attendant.

Arecibo.—Acting Asst. Surg. Manuel Martinez Rossello.

Aguadilla.—Acting Asst. Surg. Buenaventura Jiminez.

Fajardo.—Acting Asst. Surg. Jose A. Diaz.

Humacao.—Acting Asst. Surg. James W. Brice.

Arroyo.—Acting Asst. Surg. Albert Mehrhof.

Guanica.—Acting Asst. Surg. John F. Morse.

Jobos (Aguirre).—Acting Asst. Surg. Emmett I. Vaughn.

Summaries of transactions.

San Juan:		
Steam vessels inspected		197
Sailing vessels inspected		45
Vessels held in quarantine		44
Vessels fumigated		80
Net tonnage of vessels fumigated		44, 000
Sulphur consumed	pounds	19, 000
Rats and mice killed		286
Packages of cargo fumigated to kill rats		77, 937
Crew inspected		17, 596
Passengers inspected, incoming		5, 223
Passengers inspected, transit		14, 054
Passengers detained for observation		590
Total number of days passengers in quarantine		1, 952
Cases of sickness (nonquarantinable) occurring among passengers in quarantine		2
Bills of health issued		249
Immigrants inspected		3, 116
Immigrants certified		19
Certified immigrants landed		15
Certified immigrants deported		4
Service patients treated in hospital		123
Days relief furnished		2, 375
Service patients treated at out-patient office		298
Times relief furnished		484
Medical inspection of seamen, etc		57
Ponce:		
Steam vessels inspected		104
Sailing vessels inspected		27
Vessels held in quarantine		18
Vessels fumigated		2
Packages of cargo fumigated to kill rats		11, 318
Crew inspected		7, 634
Passengers inspected, incoming		724
Passengers inspected, transit		8, 370

Ponce—Continued.	
Passengers detained for observation	17
Total number of days passengers in quarantine	51
Bills of health issued	128
Immigrants inspected	167
Immigrants certified	4
Certified immigrants deported	4
Service patients treated in hospital	11
Days relief furnished in hospital	116
Service patients treated at out-patient office	28
Times relief furnished	67
Mayaguez:	
Steam vessels inspected	100
Sailing vessels inspected	43
Vessels held in quarantine	25
Vessels fumigated	2
Packages of cargo fumigated to kill rats	4, 277
Crew inspected	5, 953
Passengers inspected, incoming	892
Passengers inspected, transit	3, 545
Bills of health issued	83
Immigrants inspected	310
Immigrants certified	4
Certified immigrants landed	3
Certified immigrants deported	1
Guanica:	
Steam vessels inspected	66
Vessels held in quarantine	1
Vessels fumigated	2
Crew inspected	2, 700
Crew detained for observation	28
Passengers inspected, incoming	184
Immigrants inspected	12
Arecibo:	
Steam vessels inspected	13
Crew inspected	838
Passengers inspected, incoming	4
Passengers inspected, transit	382
Bills of health issued	13
Immigrants inspected	4
Fajardo:	
Steam vessels inspected	7
Sailing vessels inspected	6
Crew inspected	187
Passengers inspected, incoming	16
Passengers inspected, transit	15
Bills of health issued	17
Immigrants inspected	2
Aguadilla:	
Steam vessels inspected	5
Sailing vessels inspected	4
Vessels held in quarantine	1
Crew inspected	431
Passengers inspected, incoming	8
Passengers inspected, transit	64
Bills of health issued	17
Immigrants inspected	5
Arroyo:	
Sailing vessels inspected	4
Crew inspected	34
Bills of health issued	15
Humacao:	
Sailing vessels inspected	4
Crew inspected	26
Bills of health issued	20
Jobos (Aguirre), bills of health issued	17

Special yellow fever measures.—Owing to the occasional appearance of yellow fever at ports of Venezuela, vessels from these ports en route to the United States and Spain are held in quarantine, but during their short stay in Porto Rico are allowed to transact business under certain restrictions while anchored in the bay. Nonimmune passengers, who can not show evidence of having left such ports six days before arrival in Porto Rico, are detained in quarantine to complete the six-day period.

On rare occasions there are vessels from infected or suspected ports of Trinidad, Brazil, etc., which are treated in similar manner.

Outgoing plague quarantine.—After the eradication of plague in Porto Rico, the outgoing quarantine restrictions were modified on different occasions until at present the measures are fumigation of vessels for the destruction of rats every six months, and the use of rat guards on the lines when vessels are moored alongside piers.

Bills of health are issued by service officers at Porto Rican ports to all vessels destined to ports in the United States, and to foreign ports when the master of the vessel so desires.

Fumigation of vessels.—Under the provisions of bureau circular of August 4, 1913, vessels from certain ports have been fumigated before being allowed to dock. They are mostly small sailing vessels from West Indian ports.

Vessels from these ports, which make Porto Rican ports only as ports of call, are prohibited from docking, but are allowed to transact business while at anchor in the bay, provided precautions are taken to prevent rats being carried ashore.

Vessels coming within the requirements of fumigation at six months intervals are fumigated at San Juan or at the United States port, as may be most convenient.

Fumigation of cargo.—The fumigation of cargo for rats, which was put into force during the past fiscal year, has been continued in the same manner. San Juan, Ponce, and Mayaguez are the only ports where such cargo is received. At San Juan hydrocyanic gas is used; at Ponce and Mayaguez, sulphur dioxide gas.

Quarantinable diseases.—During the year the quarantinable diseases present in Porto Rico have been leprosy and smallpox.

Lepers are isolated on Cabras Island, at the entrance of San Juan Bay, as soon as the diagnosis is positively made. At present there are 36 patients so segregated.

One case of smallpox was reported from Moca, P. R. There was some doubt as to diagnosis.

During the year no vessel arrived at a Porto Rican port with quarantinable disease on board.

A passenger on the Spanish steamship *Manuel Calvo*, with femoral bubo, was suspected of having bubonic plague. The vessel remained in quarantine during her stay in port. Passengers for San Juan, 94 in number, were held in observation at the quarantine station for five days, by which time cultural and animal inoculation tests showed the case to be one of staphylococcus infection, and these passengers were released.

Buildings and property.—Five new buildings at the San Juan quarantine station were completed in December, 1913, and put into use. They are of brick overlaid with cement stucco, with galvanized roofing. They consist of a laundry; a building containing quarters for attendants, kitchen, dining room, and small storerooms; executive building with pharmacist's quarters; a lazaretto; and a disinfecting building on the wharf.

The grounds about the new buildings have been cleared, graded, and planted in grass. The roadway to the mainland has been repaired and a new branch road built to the new buildings.

MEDICAL INSPECTION OF IMMIGRANTS.

This inspection is conducted by the officers of the service at Porto Rican ports under the same laws and regulations as at ports in the United States proper.

Immigrants to the number of 3,116 were inspected at San Juan and 500 at the subports. At San Juan 19 were certified, of whom 15 were landed and 4 deported. At the subports 8 were certified, of whom 3 were landed and 5 deported. (See statistical tables under "Medical inspection of immigrants.")

PLAGUE ERADICATION.

No human or rodent plague has been reported in Porto Rico during the year.

The antiplague operations of the service were under the direction of Passed Asst. Surg. R. H. Creel until his departure from Porto Rico, after which Passed Asst. Surg. C. W. Chapin took charge of that branch of work until its cessation by the service, October 31, 1913.

The laboratory examination of rodents has been continued by the sanitation service of the insular government. The weekly statements from November 1, 1913, to July 3, 1914, show 21,731 rats, 8,212 mice, and 71 mongoose examined with negative result. The majority of these rodents were caught in San Juan and the suburbs of Puerta de Tierra and Santurce.

MISCELLANEOUS DUTIES.

Such duties include physical examination of seamen, applicants for pilots license, for enlistment in the Revenue-Cutter Service, collection of vital statistics, executive duties, etc.

At the request of the governor of Porto Rico, Surg. W. W. King, in addition to his duties as chief quarantine officer, was detailed as member of the Institute of Tropical Medicine and Hygiene of Porto Rico, organized for the study of diseases peculiar to that country and climate.

OPERATIONS OF THE SERVICE IN HAWAII.

ANNUAL REPORT OF SERVICE TRANSACTIONS IN THE HAWAIIAN ISLANDS FOR THE FISCAL YEAR ENDED JUNE 30, 1914.

The operations of the service in the islands were under the direction of the chief quarantine officer with headquarters at Honolulu and can be included under four heads, namely, quarantine, marine hospital relief, immigration, and plague laboratory.

GENERAL.

The quarantinable diseases were unusually prevalent at the majority of the foreign ports touched at by vessels arriving at the Hawaiian ports.

Human plague was present throughout the year at ports on the west coast of South America and at Yokohama, Manila, and Hongkong, the diseases at the latter named port assuming epidemic proportions toward the close of the fiscal year, while rat plague was present all the year at Shanghai, Hongkong, Kobe, and Yokohama.

Cholera prevailed at both Hongkong and Manila and necessitated the detention of steerage passengers from those ports on arrival for examination for cholera carriers with the result that two carriers were found.

Smallpox was present in Australian, Chinese, and Japanese ports, and toward the close of the year was unusually prevalent at Nagasaki and Hongkong.

In March, 1914, an explosive outbreak of typhus fever occurred at Tokio and the disease has since spread to Yokohama and other cities in Japan, but has not assumed epidemic proportions.

QUARANTINE STATIONS.

Honolulu.—In March, 1914, the new sewer system at the quarantine station was completed and satisfactorily fulfilled all the tests. Latrine buildings, consisting of concrete floors on pillars with wooden sides and galvanized roofs, were erected in the military camp, one for each European compound and one for the Asiatic compound. The sewage flows through pipes to the septic tanks, thence into the chemical treating chamber if necessary, and finally reaches the pump chambers and by means of automatic electrical pumps is emptied out on the reef, a distance of 2,500 feet from the station.

The installation of this sewer system is the most important improvement made to the station during the year.

Hilo.—The Territory has completed the wharf at Hilo, which is capable of berthing vessels drawing 35 feet of water. The South American steamers of the Toyo Kisen Kaisha Steamship Co. now make Hilo a regular port of call on the outward voyage.

Subports.—At the ports of Mahukona, Kahului, Lahaina, Makaweli, and Koloa incoming vessels were boarded and inspected by acting assistant surgeons of the service.

Vessels inspected.—Five hundred and twenty-two vessels were boarded and inspected by service officers upon arrival at ports of entry in the Hawaiian Islands, namely, Honolulu, 471; Hilo, 22; Mahukona, 9; Kahului, 13; Koloa, 1; Lahaina, 0; and Makaweli, 6.

Quarantine certificates.—Three hundred and nineteen certificates were issued at Honolulu, 82 at Hilo, 6 at Makaweli, 8 at Lahaina, 9 at Mahukona, 13 at Kahului, 1 at Koloa to vessels bound for United States and foreign ports.

These certificates stated that during the time the vessel was in port the required precautions to prevent rats from gaining access to the vessel were observed.

Vessels fumigated.—One hundred and six vessels were fumigated at Honolulu, 22 at Hilo, for the purpose of rat eradication, while

13 vessels were fumigated at Honolulu, 1 at Makaweli, and 2 at Kahului for the destruction of mosquitoes.

PLAGUE IN HAWAII.

The only cases of plague, either human or animal, during the year occurred on the island of Hawaii; the disease which has been present on Hawaii for the past 14 years remained localized in the Hamakua district, there being three cases of human plague and six of rodent plague.

Of the human cases, all occured in the persons of Japanese, the type of the disease being pneumonic in one case and glandular in the remaining two.

The Territorial board of health laboratory at Honokaa was closed in August, 1913, and all rats trapped in the Honokaa district were thereafter sent to the laboratory at Hilo. This has resulted in a considerable saving, besides rendering the work more effective.

The rat yield and plague infection in rodents is shown in the following table:

Month.	Hilo district.	Infected rats.	Hamakua district.	Infected rats.
July	5,481		5,976	1
August	8,937		[1] 6,571	
September	10,857			
October	12,171			
November	16,246			2
December	12,099			1
January	12,437			2
February	9,741			
March	9,713			
April	9,845			
May	10,442			
June	7,729			
Total	125,698		12,547	6

[1] Closed Aug. 23, 1913.

VESSELS ARRIVING WITH QUARANTINABLE DISEASE OR HAVING HAD SAME DURING THE VOYAGE.

Leprosy.—The American steamship *Manchuria* arrived July 2, 1913, from San Francisco with a case of leprosy. The patient, a Spaniard, had left Honolulu on the *Manchuria* June 10, 1913, and was detected on quarantine inspection at San Francisco. Inquiry showed that the patient had arrived from Spain in 1911 and had worked on a plantation near Hilo until just before his departure.

He was turned over to the Territorial board of health and was later deported to Spain. The compartment occupied by the patient on the *Manchuria* was thoroughly disinfected and all bedding, clothing, and cooking utensils immersed in bichloride solution.

Japanese steamship *Tenyo Maru* arrived February 6, 1914, from Asiatic ports, and on quarantine examination of the personnel a case of leprosy was found in the person of a Filipino steerage passenger. There was present an ulcer on the palmar surface of the left hand and one on the plantar surface of the left foot.

Cholera.—The British steamship *Nile* arrived November 21, 1913, from oriental ports with the history of having had a case of cholera among her steerage passengers at Manila. After the vessel's departure from Manila it was found that two of her passengers were cholera carriers. Accordingly, word was sent by Surg. Heiser to the American consul at Nagasaki requesting that the Japenese officials be notified, and on the vessel's arrival at the last-named port, she was held in quarantine and an examination was made of the two Filipinos, as well as all the steerage passengers. The result being negative, the steerage passengers were bathed, steerage quarters and forecastle disinfected and the vessel released.

On arrival at Honolulu the steerage passengers were detained and examined for cholera carriers, with a negative finding. The bill of health of this vessel stated that for the two weeks ended October 25, 1914, there had been 34 cases of cholera with 26 deaths in the city of Manila.

CHOLERA CARRIERS.

Owing to the prevalence of cholera in the Philippines in the fall of 1913 and because of the large numbers of carriers being found at Manila, it was decided to detain upon arrival at Honolulu all Filipino laborers being brought into the islands under contract and examine them for cholera carriers.

The examination was begun in December, 1913, and from that date until the close of the year 1,242 persons had been examined, 2 of whom were found to be cholera carriers.

Under an arrangement between the Territorial Board of Health and the Hawaiian Sugar Planters' Association, the importers of the Filipinos, the cholera carriers were deported to the port of embarkation, namely, Manila.

Smallpox.—The Japanese steamship *Shinyo Maru* arrived March 5, 1914, from Asiatic ports with the history of having landed a steerage passenger at Nagasaki on account of smallpox. On arrival at this port the personnel were carefully inspected, and, the vaccination as done by the ship's surgeon being considered efficient, the vessel was granted pratique.

American steamship *Siberia* arrived March 22, 1914, from oriental ports with the history of having landed a case of smallpox at the Nagasaki quarantine. On arrival the personnel were carefully inspected, and, because vaccination had been thoroughly performed and 14 days had elapsed since the removal of the case and disinfection of the vessel at Nagasaki, she was given pratique.

Japanese steamship *Chiyo Maru* arrived from Japanese and Chinese ports on March 27, 1914, with the history of having landed a case of smallpox at Nagasaki.

Nothing suspicious being found on quarantine inspection of the personnel, and as all the necessary precautions had been taken, the vessel was accordingly granted pratique.

American steamship *Manchuria* arrived April 15, 1914, from Yokohama and other ports with the history of having landed two cases of smallpox at the Nagasaki quarantine on March 31 and one at Kobe on April 3.

The personnel were bathed, vaccinated, and effects disinfected at both Nagasaki and Kobe and the crew's quarters and steerages disinfected.

The quarantine inspection of the personnel on arrival showed nothing except a well-marked case of varicella in a Japanese child in the steerage.

In connection with the history of this vessel, it is interesting to note that on the outward voyage from Yokohama to Manila six cases of chickenpox occurred, and were landed at the latter-named port; therefore it is not improbable that the cases landed at Nagasaki and Kobe were cases of the same disease.

American steamship *Siberia* arrived June 6, 1914, from Asiatic ports with a Chinese steerage passenger ill with smallpox, and the history of having landed a previous case at Kobe on May 24, at which time the steerage was disembarked, bathed, and effects disinfected, and all personnel vaccinated except the cabin passengers.

The case of smallpox on board was removed to the quarantine station and there isolated, the hospital, forecastles, and steerage quarters disinfected.

The second-class passengers, steerage, and crew bathed, effects disinfected, and all persons not showing a recent successful vaccination were vaccinated.

As all the passengers for Honolulu were protected by recent successful vaccination, it was therefore not necessary to detain any of them in quarantine.

VESSELS ARRIVING WITH CONTAGIOUS BUT NONQUARANTINABLE DISEASES ON BOARD.

Varicella.—Two vessels arrived with this disease on board, there being one case on the steamship *Manchuria*, arriving April 15, 1914, and two on the steamship *Shinyo Maru*, May 22, 1914.

Measles.—The steamship *Manoa* arrived May 19, 1914, from San Francisco with a case of measles in a cabin passenger.

Beriberi.—During the year the Japanese liners, almost without exception, arrived with cases of this disease amongst the crew, in some instances there being quite a few cases, as, for instance, the steamship *Kiyo Maru* arrived from the west coast of South America on December 12, 1913, with three of the crew in the hospital, and again on April 11, 1914, this vessel again arrived with two steerage passengers and four of the crew ill with the disease. In both instances the disease was of the "wet" variety. A varied diet is furnished on these vessels, and polished rice is not used.

AID RENDERED OTHER GOVERNMENT SERVICES.

Board of health.—Ten cremations were done during the year at the quarantine station for the board of health, of which six were of persons dying of leprosy and four were suspected cases of plague, etc.

Many inoculation and cultural experiments were made in the service laboratory in suspected cases of plague, cholera, typhoid, and pneumonia, while a large amount of media was prepared and swabs sterilized for use in their diphtheria work.

United States Army.—The mine planter *General Samuel Ringgold* was twice fumigated, upon the request of her commanding officer, for the eradication of vermin.

Queen's Hospital.—Many Widal's, besides cultural and inoculation experiments, were made in the service laboratory for Queen's

Hospital. In addition a large number of mattresses were sterilized by steam upon the request of the hospital authorities.

United States Revenue-Cutter Service.—Thirteen seamen were treated at the out-patient office and 20 in the hospital.

One commissioned officer was physically examined for promotion by a board of medical officers of the service.

With the exception of a few days in the month of June, Asst. Surg. L. E. Hooper served continuously throughout the year on the revenue cutter *Thetis*, and thus the number of seamen of the Revenue Cutter Service treated in the out-patient office was considerably less than during the preceding year.

RAT CAMPAIGN—HONOLULU.

In the district of Honolulu 23,529 rats and mongoose were caught, 23,267 being trapped, 35 found dead, 77 killed by sulphur dioxide, and 166 shot from trees.

Nine rat catchers were employed until February, when, owing to a reduction in the amount allotted for the rat campaign, it was necessary to discharge one trapper and otherwise reduce the expenses to keep within the appropriation.

Mus alexandrinus continued to lead in the number of rats trapped, there being 8,867 of this variety, 2,143 *Mus rattus*, 1,832 *Mus norvegicus*, and 9,970 *Mus musculus*.

Seventy-five per cent of the rats trapped were obtained from the fields, 19 per cent from gulches and ravines, 4 per cent from houses and barns, and the remainder from trees and places unknown.

PLAGUE LABORATORY.

The city of Honolulu and the island of Oahu remained free of plague during the year. There were trapped and examined bacteriologically 23,529 rats and mongoose, with a negative result.

Cultures and specimens from suspected cases of plague on the island of Hawaii were referred to the laboratory for diagnosis.

A great deal of work was done in the laboratory for the board of health in connection with the outbreak of diphtheria in Honolulu in the spring of the year. In addition numerous Widal's and cultural and inoculation experiments were carried out for the Queen's Hospital.

Quarantine transactions at Honolulu, Hawaii.

Vessels inspected and passed	402
Vessels boarded and passed	42
Vessels inspected and detained for fumigation for mosquitoes	13
Vessels inspected and detained for fumigation for rat quarantine	9
Vessels inspected and detained and allowed to transact business in quarantine	4
Vessels disinfected	1
Vessels fumigated for rat quarantine	97
Vessels fumigated by request	2
Vessels arriving with quarantinable disease or having had same on board during voyage	8
Number of port sanitary statements issued	319
Number of rats and mice killed on vessels by fumigation	80
Number of passengers inspected	76, 134
Number of passengers detained	290
Number of crews inspected	58, 943
Number of persons vaccinated	223

Number of persons treated in quarantine hospital upon request	1
Number of persons treated for quarantinable diseases	3
Number of persons bathed	495
Number of pieces of baggage disinfected	475
Number of pieces of freight inspected and passed	363, 669
Number of hides disinfected	12, 635
Number of autopsies	2
Number of rats and mongoose trapped and destroyed	23, 529
Number of cremations	10
Number of cholera carriers detained	2

Quarantine transactions at subports.

	Hilo.	Kahului.	Mahukona.	Lahaina.	Makaweli.	Koloa.
Vessels inspected and passed	22	13	9	0	6	1
Vessels fumigated for rat quarantine	43	0	0	0	0	0
Vessels fumigated for mosquitoes	0	2	0	0	1	0
Outgoing quarantine certificates issued to vessels	82	13	9	0	6	1
Baggage inspected and passed	0	0	0	0	0	0
Baggage and freight disinfected	2,196	0	0	0	0	0
Hides disinfected	2,776	0	0	0	0	0
Passengers inspected and passed	0	0	0	0	5	0
Crews inspected and passed	453	266	106	0	91	10

PLAGUE LABORATORY.

Total rats, mice, and mongoose taken	23, 529
Rats trapped	22, 812
Mongoose trapped	455
Rats found dead	41
Rats killed by sulphur dioxide	77
Rats shot from trees	166
Examined macroscopically	23, 429
Examined bacteriologically	100
Showing pest infection	0
Classification of rats trapped:	
Mus alexandrinus	8, 867
Mus musculus	9, 970
Mus norvegicus	1, 832
Mus rattus	2, 143
Classification of rats found dead:	
Mus alexandrinus	3
Mus musculus	2
Mus norvegicus	8
Mus rattus	5
Classification of rats killed by sulphur dioxide:	
Mus alexandrinus	45
Mus musculus	13
Mus rattus	19
Classification of rats shot from trees:	
Mus alexandrinus	159
Mus rattus	7
Total number of rat trappers	9
Number of traps sets daily	1, 085
Increase in number of rats, mice, and mongoose caught as compared with last year	6, 741

HILO.

Number of Hilo rats under investigation at beginning of year plague infected	1
Number of Hilo rats referred to this laboratory for bacteriological diagnosis	1

Cases of human plague on the island of Hawaii from Feb., 1900, to June 30, 1914.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1900		1	2		1							1	5
1901													
1902													
1903			3						2				5
1904			1		2		1	1					5
1905						2	2						4
1906	1	1											2
1907								2		1			3
1908		1		1									2
1909								5	4	1			10
1910			8									1	9
1911	2			1						2			5
1912		3	1						1			3	8
1913	2				2								4
1914			1		1	1							3
Total	5	6	16	2	6	3	3	8	7	4	0	5	65

Cases of rat plague on the island of Hawaii from Aug. 28, 1907, to June 30, 1914.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1907								11		32	4		47
1908		1										30	31
1909	6	3	5	3				4	15	7		1	44
1910	1		6	2								4	13
1911	1	1				4						1	7
1912	5	55	16	2					1	1	1	4	85
1913	4	6	1		1	1	1				2	1	17
1914	2												2
Total	19	66	28	7	1	5	1	15	16	40	7	41	246

FOREIGN QUARANTINE.

The duties of officers of the Public Health Service detailed at foreign ports are as follows:

1. The determination of the sanitary history of all vessels destined for ports in the United States, its possessions, and dependencies.
2. The inspection of vessels, crews, and passengers and the certification of freight, with special reference to the opportunities afforded at foreign ports of infestation of either vessels or freight by rodents.
3. The fumigation of ships for the destruction of rats and mosquitoes, or the disinfection of ships when necessary in the event of actual infection.
4. The observation, when necessary under detention, of intending passengers for ports in the United States and its dependencies.
5. The rendition of reports by means of cable or telegraph, when necessary, as to the health and sanitary conditions of the foreign port and, when possible, of the country contiguous thereto.
6. The certification, in conjunction with the United States consular officer of the bills of health issued, said certificates to be made just prior to the departure of the ship and to cover the requirements provided for by the United States quarantine regulations.

FRUIT PORT INSPECTION SERVICE.

The fruit ports were inspected at regular intervals by Acting Asst. Surg. R. P. Ames, who reports as follows:

PUERTO BARRIOS, GUATEMALA.

The city and country contiguous was reported free from any disease of a quarantinable nature and safe for summer passenger travel. The inspector was given access to the hospitals and medical records.

No rats were observed on the docks, but they were numerous in the native district of the city.

Sanitary conditions in general had greatly improved, although in the native quarter the manaca shacks are irregularly built and surrounded by filth, the water containers disclosing many Stegomyia larvæ.

PUERTO CORTEZ, HONDURAS.

The city and vicinity were reported free from the quarantinable diseases, which includes the garrison stationed in the port. The general sanitary conditions were pronounced bad, there being many water containers in which were found the larvæ of the Stegomyia calopus, this condition constituting a serious problem in the event of the infection of the port by yellow fever.

Table giving foreign, oriental, and insular stations and transactions for the fiscal year ended June 30, 1914.

Stations.	Total number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Aquadilla, P. R	9	...	503
Arecibo, P. R	13	...	1,224
Arroyo, P. R	4	...	34
Callao, Peru	210	178	22,653
Cavite, P. I	8	...	909
Cebu, P. I	281	69	23,629
Fajardo, P. R	13	...	218
Guanica, P. R	67	2	224
Guayaquil, Ecuador	61	53	6,155
Habana, Cuba	1,166	202	105,682
Hilo, Hawaii	22	22	453
Hongkong, China	460	146	75,004
Honolulu, Hawaii	471	119	135,077
Humacao, P. R	4	...	26
Iloilo, P. I	219	225	23,155
Jolo, P. I	62	...	7,153
Kahului, Hawaii	13	2	266
Kobe, Japan	338	46	75,395
Koloa, Kauai, Hawaii	1	...	10
La Guaira, Venezuela	131	...	18,457
Makaweli, Hawaii	6	1	91
Mahukona, Hawaii	9	...	106
Manila, P. I	725	...	105,276
Mayaguez, P. R	143	2	10,490
Messina, Italy	9	...	272
Naples, Italy	298	...	168,743
Ponce, P. R	131	2	16,728
Puerto Mexico, Mexico	29	2	...
Salina Cruz, Mexico	96	96	...
San Juan, P. R	242	80	36,873
Shanghai, China	82	2	16,149
Vera Cruz, Mexico	28	25	5,175
Yokohama, Japan	345	56	93,905
Zamboanga, P. I	17	...	1,868
Total	5,582	1,330	933,446

CALLAO, PERU.

Acting Asst. Surg. J. L. Castro-Gutierrez reports as follows:

Transactions.

Vessels inspected and passed	210
Vessels fumigated	178
Crew inspected	14,006
Cabin passengers inspected	8,647
Persons vaccinated	4,025
Baggage fumigated (pieces)	2,357

Statistics concerning plague, by departments

Department.	Cases.	New.	Recovered.	Died.	Remaining.	Unknown.
Lambayeque	9	290	119	158	19	3
Libertad	26	271	129	147	21	
Lima	2	154	78	69	9	
Arequipa	7	42	28	21		
Callao	5	34	19	18		2
Cajamarca		29	20	9		
Ancachs	2	25	4	21		2
Piura	2	24	5	16	2	3

GUAYAQUIL, ECUADOR.

Passed Asst. Surg. Herman B. Parker reports as follows:

Maritime quarantine.—During the fiscal year 61 bills of health were issued to vessels bound to United States territory. Of these, 53 were bound to the Canal Zone and 8 to other ports in the United States. During this period there were inspected 3,898 crew, 533 cabin passengers, and 1,724 steerage passengers.

The following is a summary of the quarantine transactions for the year:

Bills of health issued	61
Vessels inspected and passed	8
Vessels fumigated	53
Number of crew inspected	3,898
Number of cabin passengers inspected	533
Number of steerage passengers inspected	1,724
Number of cabin passengers for United States ports	644
Number of steerage passengers for United States ports	275

Anchorage.—At the close of the last fiscal year the anchorage of former years at a point below the "matadero" was changed by executive order to an anchorage in front of the city. Owing to the continued presence of yellow fever this necessitated a change in quarantine procedure. At first it was contemplated to impose a seven-day quarantine after fumigation at Ancon, Canal Zone; this measure was afterwards changed to complete fumigation at time of sailing from Guayaquil, and that is the custom at the present time. This change in anchorage has naturally increased the commercial facilities of the port and, so far, with the change in fumigation of the vessel, has not been dangerous to foreign ports.

Vessels bound for New York via the Straits of Magellan are inspected and passed as formerly, owing to the necessity of complete fumigation in Chilean ports and at the first port of entry in the United States.

Cargo.—The principal cargo from Guayaquil is cacao. Each year from 750,000 to 1,000,000 quintals are shipped. This product is practically all shipped through Guayaquil—dried in the public streets and then placed in sacks for shipment. There is an erroneous impression that cacao is not a rat food. On the contrary, it is rather liked by these rodents, and if mixed with white cacao rats will eat through the bags in search of it. Cacao bodegas are annually infested with plague rats and human cases are not rare.

Hides are subject to the usual arsenic treatment before shipment, and receive sulphur treatment on board the vessel at the time of sailing. Little difficulty is encountered in enforcing this regulation, as the buyers require this treatment to protect against putrefaction in transit.

Lana de ceiba, or vegetable wool, is a product that is annually meeting with an increasing demand. Like cotton, it has a seed, which is required to be removed before shipment, as these seeds serve as a good rat food on board the vessel.

Certificates are required for cotton on account of the seed, which must be removed before shipment, for the reason stated above.

Plague and yellow fever on outgoing ships.—As far as can be ascertained neither of these diseases appeared on outgoing ships during the fiscal year.

Yellow fever in Guayaquil.—During the fiscal year this disease has been much less than in former years, but 75 cases being reported, of which 35 recovered and 42 died (two cases remaining from the previous year). Of these 75 cases, 48 were reported as originating in Guyaquil, 11 in Milagro, 12 in Naranjito, 1 in Bucay, 1 in Babahoyo, and 2 in Esmaraldas. Very few of these cases occurred among the foreign population, practically all being among the natives from the interior. During the previous fiscal year there were reported 386 cases, with 223 deaths. Inclosed is a tabular statement from the director of health for Ecuador, giving the cases and deaths by months.

Plague in Guayaquil.—During the fiscal year there were reported 639 cases of plague, of which 278 recovered and 262 died (one case remaining from the previous year). Of these cases 2 occurred in Duran, 7 in Yaguachi, 2 in Milagro, 1 in Naranjito, and 1 in Babahoyo. Other cases occurred in the town of Alausi and surrounding country, but the number of cases is not known. During the previous fiscal year there were reported 576 cases, 63 less than the present year and 145 deaths or 183 less than the present year. As in former years, the disease began in numbers in September, with a maximum number in November. At the conclusion of the rainy season the disease disappeared in epidemic proportions and became sporadic only. Practically all these cases occurred among the native population.

General vaccination is applied as a prophylactic measure to the traveling public.

The altitudes of the interior still resist the invasion of this disease, and as rats and fleas are abundant it is supposed that the cold is the factor most concerned.

Dysentery.—While dysentery of the amebic type has always prevailed throughout the Republic, this year has been characterized by an outbreak of the bacillary type. The most of these cases have occurred in the Army, and many deaths have resulted. Three cases have been removed from vessels bound to the Canal Zone prior to sailing, the infection in each case having occurred on board from contact with sick soldiers. Specific instructions have been given to masters of vessels engaged in the coastwise trade as to the manner of cleaning and disinfecting the toilets on board. Antidysenteric serum is used mainly in the treatment, and if used in sufficient quantity has a very decided beneficial effect.

Emetine hydrochloride is used in the treatment of the amebic type of the disease with the most remarkable results, especially to one familiar with the older methods of treatment.

Typhoid fever.—This disease prevails extensively in Guayaquil, but to a greater extent in the cities in the interior. Flies are assumed to be the medium of spreading the infection rather than the water supply, which comes from an uninhabited part of the country. The milk supply does not figure largely in the dissemination of the disease, as it is the invariable custom to boil all milk before using it as a food.

Tuberculosis.—This disease still is far in advance of all the other diseases as the cause of the high mortality of the city. The native dread of light and air is the principal cause of the ravages of the disease. Every effort is being made to instruct the classes as to the danger, but, unfortunately, it is difficult to overcome the prejudices of centuries, especially when death has become so familiar that it has lost its terrors.

Sanitation of Guayaquil.—During the fiscal year a contract was signed with the house of J. G. White & Co., of London, for the sanitation of Guayaquil. Work was immediately commenced on the surveys, and materials have been ordered for the water supply for the city. It is contemplated to lay the city water supply first, owing to the bad state of the present tubing, and then to increase the water supply from an available source not yet decided upon. After the completion of the water supply, work will be continued on the sewer and street improvements.

Yellow fever in Guayaquil during the fiscal year ended June 30, 1914.

Month.	New cases.	Recovered.	Died.
July	8	4	5
August	9	4	5
September	8	4	5
October	5	4	1
November	7	2	5
December	7	2	4
January	7	5	2
February	9	6	3
March	6	2	5
April	6		6
May	3	2	1
June			
Total	75	35	42

Plague in Guayaquil during the fiscal year ended June 30, 1914.

Month.	New cases.	Recovered.	Died.
July	13	2	3
August	22	14	11
September	46	31	11
October	112	53	36
November	197	72	85
December	159	123	75
January	57	54	23
February	17	15	11
March	8	6	4
April	2	5	0
May	3	1	1
June	3	2	2
Total	639	378	262

YOKOHAMA, JAPAN.

Surg. John S. Boggess reports as follows:

Transactions.

Steamers inspected and granted bills of health	326
Sailing vessels inspected and granted bills of health	14
United States Navy vessels inspected and granted bills of health	3
Imperial Japanese navy vessels inspected and granted bills of health	2
Total	345
Vessels fumigated	56

Passengers and crews on above vessels as follows:

First cabin	8,139
Second cabin	3,629
Steerage	34,782
Crews	47,355
Total	93,905
Passengers inspected and issued immigration inspection cards	5,480
Passengers bathed and required to undergo special inspection	1,979
Crews bathed and required to undergo special inspection	148
Pieces of baggage disinfected	3,719
Boxes of human hair inspected	70
Cases and bales of skins inspected	22
Bales of feathers inspected	137

In general, the work of the office is the sanitary supervision of all vessels (including cargo, passengers, and crews) that intend to depart either directly or indirectly for continental or insular United States ports, and is effected in the following manner: Before cargo is put on board vessels at the wharf or loaded onto lighters for vessels at anchor in the harbor cargo lists or "boat notes" are submitted for approval, and stevedores are not permitted to handle shipments until such approval is obtained. Immediately after coming to the wharf vessels are inspected to see that they are properly fended off, that efficient rat guards are in place, and that other practicable precautions are taken to prevent egress or ingress of rats, and the vessels are subsequently inspected from time to time to see that these precautions are maintained. Immediately prior to sailing passengers and crews (officers and first-cabin passengers excepted at discretion) are visually examined and their pulse rate noted. Those presenting evidence of fever are carefully examined and if any quarantinable disease is suspected their disembarkation is recommended. This practically amounts to an order, for the bill of health is not valid unless countersigned by the service officer, and such signature would be withheld unless the recommendations were followed. During the prevalence of quarantinable disease passengers from infected districts are required to live in approved houses in Yokohama for the period of incubation of the disease before embarking, during which time they report daily for examination. The routine bathing and disinfection of baggage of steerage passengers have been discontinued, but are required in connection with certain quarantinable diseases under some circumstances. Masters and agents of vessels are kept informed as to what vessels will require fumigation, and this (together with the bathing and disinfection of steerage passengers and their baggage) is done under supervision of the service officer and certified accordingly.

About the 1st of March typhus fever was reported in Tokyo (presumably brought in from northern Japan) and increased very rapidly, 2,500 cases occurring the first three weeks. The sanitary authorities took prompt, vigorous, and successful action toward eradicating the disease, and now few cases are being reported. Four thousand and thirty-six cases have been reported up to the present time. The percentage of mortality is reported at about 12 per cent. About one month later typhus fever appeared in Yokohama, but due to prompt and energetic action of the authorities the epidemic did not assume serious proportions. It has now so nearly subsided in both places that the epidemic is practically over. At the height of the epidemic steerage passengers from infected districts (practically all prefectures of northeastern Japan had the disease) were kept under observation at Yokohama for 12 days and were bathed and their personal effects sterilized before embarkation.

Population of Yokohama	396, 101
Total births during calendar year of 1913	10, 075
Total deaths during calendar year of 1913	6, 878

Communicable diseases in Yokohama.

	During the calendar year 1913.		During 5 months ending May 31, 1914.	
	Cases.	Deaths.	Cases.	Deaths.
Typhoid fever	239	70	98	33
Typhus fever	0	0	88	13
Paratyphoid fever	46	8	10	3
Diphtheria	227	74	118	35
Dysentery	55	3	3	1
Cholera	3	3	0	0
Scarlet fever	37	5	35	3
Relapsing fever	16	1	1	0
Smallpox	4	1	0	0
Plague	21	17	2	1
Total	648	182	355	89

HABANA, CUBA.

The following is the report of Surg. G. M. Guiteras for the fiscal year ended June 30, 1914:

Acting Asst. Surg. Richard Wilson was in charge of the station from July 1, 1913, until April 8, 1914, when Surg. R. H. Creel was sent from Washington to take charge of the station and to perfect the organization of the outgoing quarantine measures, made necessary by the presence of plague in Habana.

Surg. G. M. Guiteras relieved Surg. Creel on May 28, 1914.

Quarantine transactions.

Vessels inspected	1,166
Vessels not inspected (via foreign ports)	352
Total bills of health issued	1,518
Members of crews inspected	61,976
Members of crews not inspected	14,319
Total members of crews	76,295
Passengers inspected, embarking in Habana	37,904
Passengers inspected in transit	5,802
Total passengers inspected	43,706
Passengers not inspected, embarking in Habana	486
Passengers not inspected in transit	1,627
Total passengers not inspected	2,113
Total passengers	45,819
Passengers for the United States and its dependencies	41,198
Vaccination certificates issued for the Canal Zone and Panama	111
Other vaccination certificates	95
Health certificates	5,203
Vessels fumigated	202
Vessels fumigated by the Cuban authorities, under the supervision of the service	86
Vessels recommended for fumigation on arrival at United States ports	25
Permits issued for embarking crated fruit, etc	1,713

Bills of health were issued to 1,518 vessels bound for United States ports and its dependencies. This gives an average of 126.5 per month. The smallest number issued in one month was 116 in August, 1913, and in January, 1914. The largest number was 151 in May, 1914. In the last quarter of this fiscal year 427 bills of health were issued, which is the largest number in one quarter.

Of the 1,518 vessels receiving bills of health 1,166 were inspected before leaving Habana, because they were going direct to a United States port. The other 352 vessels were not inspected, because they were going to the United States via Cuban or other foreign ports.

On vessels inspected the number of the crews was 61,976; the number of the passengers was 43,706.

On vessels not inspected the number of the crews was 14,319; the number of the passengers was 2,113.

This makes a total of crews on these vessels of 76,295 and a total of passengers of 45,819.

Of these passengers, 41,198 were going to the United States and its dependencies.

Table No. 1, which follows, shows the increase of the work this year compared with last year:

TABLE NO. 1.

	1912–13	1913–14	Increase.
Bills of health issued	1,477	1,518	41
Vessels inspected included in the above	1,107	1,166	59
Members of crews of outgoing vessels inspected	59,199	61,976	2,777
Passengers of outgoing vessels inspected	43,915	43,706	[1] 209

[1] Decrease.

Two series of personal certificates were issued this year, the first on account of yellow fever in Mexico, the second on account of bubonic plague in Habana.

First.—At the beginning of the fiscal year passengers from Mexico coming to Habana in transit for the United States were detained to complete six days from the last Mexican port before they could land in the United States. The number of certificates issued was 95.

In order to complete the record of that epidemic in Mexico (which began in the fiscal year 1912–13), it is necessary to quote from last year's report, that in May and June, 1913, the number of these certificates issued was 225; this makes a total on account of that epidemic of 320 certificates.

Second.—Personal certificates were issued again in March, 1914, this time on account of bubonic plague in Habana, the first case being confirmed on March 5. Passengers for the United States and its dependencies had to prove that they had lived outside of the infected zone for the seven days preceding embarkation. In March 3,718 certificates were issued, and in April 1,390, making a total of 5,108 certificates issued in the six weeks ended April 15, when they were discontinued.

The total personal certificates issued during the year was 5,203.

During the fiscal year 111 vaccination certificates were issued for the Canal Zone and the Republic of Panama.

In addition to this, 95 persons were vaccinated, being the crew and passengers of the French steamship *Virginie*, which arrived with one case of smallpox and was going direct to New Orleans, leaving Habana April 15, 1914.

Fumigation of vessels for the purpose of killing rats was practiced throughout the year. In the first eight months very few fumigations were made, under instructions from the bureau which ruled that a fumigation was good for six months. But since the bubonic plague broke out in March, 1914, this work has increased considerably. The following table shows the increase during the last four months, as compared with the first eight months of the fiscal year:

TABLE NO. 2.

	First 8 months.	Last 4 months.	Total year 1913–14.
Fumigations made by the service	39	163	202
Fumigations made by the Cuban authorities under the supervision of the service	14	72	86

Fumigations are divided into two classes: First, "Vessels fumigated by the service"; this includes all vessels going direct to the United States. Second, "Vessels fumigated by the Cuban authorities under the supervision of the service"; these are vessels going to the United States via Cuban ports. In the latter case the service fumigator is sent on board, and if he sees that the vessel is fumigated according to the regulations, he so reports, and a certificate to that effect is issued to the vessel.

Comparing the fumigations of this year with those of the year 1912–13, it seems considerably less, but this is explained by the fact that last year fumigations were made throughout the year, on account of the outbreak of bubonic plague in July, 1912, while in the year 1913–14 fumigations had almost ceased when the new outbreak of bubonic plague occurred in March, 1914. The average for this period from March 5 to June 30, 1914, is higher than the monthly average for the year 1912–13. The following table shows the total number of vessels fumigated by the service or under its supervision for the fiscal years 1913 and 1914:

TABLE NO. 3.

	1912–13	1913–14
Vessels fumigated by the service	360	202
Vessels fumigated by the Cuban authorities under the supervision of the service	108	86

In addition to the fumigations made in Habana, 25 vessels were recommended for fumigation on arrival at a United States port. This was done for various reasons, among them (1) at the beginning of the epidemic, before the office force was properly organized; (2) a vessel arriving partly loaded, with the object of finishing at Habana, the nature and bulk of the cargo being such that it was not practicable to fumigate; (3) the fumigation at Habana had failed, and while tampering was suspected, it could not be proved; (4) finally, certain vessels, by order of the bureau, were to be fumigated at the port of arrival instead of at the infected port.

Permits for embarking fruit in crates that were not rat proof, and other merchandise that might harbor rats, were issued after inspection, beginning in March, 1914. The total number of permits issued from March to June (both included) was 1,713. Most of these were for pineapples. This subject will be discussed at length later on.

QUARANTINE AGAINST MEXICO ON ACCOUNT OF YELLOW FEVER.

In the beginning of this fiscal year yellow fever was known to exist in various parts of Mexico. Beginning in May, 1913, in compliance to bureau orders, passengers coming from Mexico and going to southern ports of the United States, were detained at Habana to complete six days from the last Mexican port.

As Habana was a clean port, and as Cuba had quarantine then only against the states of Yucatan, Campeche, and Tobasco, it was a difficult matter to enforce these orders.

Instructions were sent to the Habana agents of the Peninsular & Occidental Steamship Co. and to the Southern Pacific Co. telling them to sell no tickets to passengers from Mexico unless they had a certificate from the Public Health Service officers in Habana. The agents of steamers bringing passengers from Mexico were notified of this restriction, and were requested to provide lists of passengers.

On July 17, in compliance with bureau telegram of that date, these restrictions were removed from passengers coming from Vera Cruz, Tuxpam, and Tampico. They were continued against Puerto Mexico and Progreso.

There being frequent communication with Mexico, the presence of yellow fever there was aggravated by the disorder of revolution, and very naturally made the Cuban Government anxious lest a case should enter unperceived, and precautions were taken to prevent it. Nonimmune passengers from the infected Mexican States above mentioned were detained at Trisconia to complete six days from departure. By this means a Chinaman who arrived August 4 by the steamship *Morro Castle*, which left Progreso August 2, was found suffering from yellow fever and sent to Las Animas Hospital for treatment. In the next four months many suspicious cases were under observation, but all proved negative.

Dr. Frank Menocal, chief of the immigration department, was asked to send lists of passengers arriving from Mexico that passed the period of observation at Trisconia.

On account of these conditions, Quarantine Inspector J. Y. Porter was ordered to make an inspection of Habana early in September, 1913.

INFECTED VESSELS.

During the fiscal year, five infected vessels and two presumably infected entered Habana Harbor.

The British steamship *Hydra* entered Habana on July 11, 1913, after having been fumigated at Mariel Quarantine Station, on account of yellow fever infection contracted in Brazil, where it had made a long stay.

Five days later, on July 16, the captain was taken ill with yellow fever and the vessel refumigated. The history of the steamship *Hydra* is interesting. After leaving Manaos, where several of the crew were ill, the vessel touched at Castries, Santa Lucia, and at Guantanamo and Cienfuegos, Cuba, being sent from the latter port to the Mariel Quarantine Station. It was fumigated at both Manaos and Castries, and its subsequent history shows that the fumigation at both places was faulty and inefficient.

From Habana the vessel went to Cienfuegos to finish loading. There the steamship *Hydra* got full of mosquitos, as reported by Acting Asst. Surg. MacCaffry at Norfolk, the next port of call.

The American steamship *Morro Castle* arrived at Habana on August 4, 1913, from Progreso, Mexico, which it left on August 2. The nonimmune passengers were sent to Trisconia to complete six days from the last port. On August 8 a Chinaman had a little fever and was sent to Las Animas as suspicious of yellow fever. It was considered a doubtful case for several days but was finally declared positive on August 14. The *Morro Castle* left Habana on August 5 for New York, and, as no one had been taken sick at that time, it received a clean bill of health.

The Russian barkentine *Vardvik* put in at Habana on August 9, 1913, on account of sickness on board. There had been one death and several sick. The disease was diagnosed as typhoid fever. The *Vardvik* had been 30 days coming from Lagunas del Carmen, Mexico. Before that it had been at Rio Grande do Sol, Brazil. It was bound for Falmouth, England.

The French steamship *Virginie* arrived at Habana on April 15, 1914, with a case of smallpox on board. The vessel was fumigated, and the crew and passengers were vaccinated. The vessel sailed from Bordeaux, France, on March 21, and came via Coruna, Vigo, Las Palmas (Grand Canary), and Santa Cruz de las Palmas (Canary Islands). It was bound next to New Orleans.

Two more vessels remain to be mentioned that may well be taken together, namely, the steamers *Balmes* and *Manuel Calvo.*

These two Spanish steamers sailed over the same course three days apart. They started from Spain, went to the Canary Islands, then to San Juan, P. R., Habana, and New Orleans.

The *Balmes* arrived at Habana first and brought a clean bill of health, but when the *Manuel Calvo* reached San Juan, P. R., the boarding officer found on inspection a passenger with symptoms suspicious of bubonic plague. As the *Balmes* had left San Juan for Habana three days previously the chief quarantine officer of Porto Rico at once telegraphed to the chief quarantine officer of Cuba informing him of the above fact.

On this account the *Balmes* was put in quarantine on arrival at Habana, and was fumigated just as a precaution, for it had no suspicious cases on board, but it had stopped at the Canary Island port where three days later the *Manuel Calvo* had taken the case that in the trip developed symptoms suspicious of plague.

The Spanish steamship *Manuel Calvo* arrived at Habana October 3, 1913, with the case suspicious of plague on board. He was sent to Las Animas Hospital. A woman who had aborted was sent there also. The vessel and all the passengers, about 400, were sent to the Mariel Quarantine Station, where those for Habana were to be detained seven days. The steamer was fumigated with 4½ pounds of sulphur per thousand cubic feet for 24 hours, after which it returned to Habana to discharge its cargo, part of which was for Habana and part in transit.

On October 6 the director of sanitation having received a cablegram from San Juan, P. R., saying that the result of their bacteriological examination in the case of the steamship *Manuel Calvo* was negative, and as that confirmed the work at Habana, the vessel was given pratique and the passengers were released from quarantine. Five hundred immigrants were landed; 40 continued on, and more passengers were taken on, some for Colon and New Orleans.

The connection, if any, of these two vessels with the epidemic of plague that broke out a few months later was the cause of a long controversy in the newspapers.

The sanitary authorities believed that there was no connection; that the outbreak was the result of infected rats remaining from 1912.

OUTGOING QUARANTINE.

At the time of the confirmation of the existence of plague in Habana, March 5, 1914, the working force of the Habana office had been reduced to a practically irreducible minimum. It consisted of the medical officer in charge, Acting Asst. Surg. Wilson, and one fumigator. As a consequence there was considerable confusion on the outbreak of plague, the office force being totally unequal to the task of attending to the calls made upon it. The American consul general was appealed to for aid, and he immediately sent one of his clerical force, Mr. W. M. Walcott, who rendered valuable assistance. The facts were promptly reported to the bureau, and on March 7 instructions were sent covering quarantine measures to be put in force against vessels and passengers bound for United States ports. The medical officer in charge was further authorized to employ a clerk and three inspectors. The instructions from the bureau directed among other things that personal "health certificates" be issued certifying that the person had not been within the infected zone for a period of seven days prior to sailing for the United States. This threw an enormous amount of work on the small office force then on duty. About 900 certificates were issued per week while this order was in force. Later, on March 10, the employment of an acting assistant surgeon and several additional inspectors was approved.

The difficulties to be met and overcome were great, but hard and conscientious work by those in charge soon brought about gratifying results, and within a relatively short time the outgoing quarantine service was fairly well organized and able to meet the demands of the situation. Rough edges here and there remained to be smoothed and the office force was overworked, but on the whole the situation was well in hand by the end of March.

The remaining difficulties were adjusted or removed and the organization perfected on the arrival in Habana of Passed Asst. Surg. R. H. Creel. Dr. Creel handled the outgoing quarantine courageously and on broad scientific principles, winning thereby the confidence and admiration of the local health authorities.

Bureau orders received relative to antiplague measures, the restrictions imposed, and the regulations issued with reference to the same are appended to this report in their chronological order.

It may be well, however, to give here a brief résumé of the regulations and restrictions which have been, and are being, enforced at Habana for vessels, passengers, and cargo, bound for the United States.

1. Vessels to be fumigated every 30 days. This was continued until about the middle of May. Subsequently the time between fumigations was made 15 days.

2. All vessels to have approved metallic rat guards on all lines and to be fended from the wharf at least 6 feet, gangways to be raised at night unless loading. With above-mentioned precautions vessels were allowed to dock at rat-proof wharves, except during the first few weeks, when they were compelled to anchor in stream. Bills of health were refused to vessels unloading at nonrat-proof wharves, unless fumigated in the stream when empty and loading from lighters.

3. Vessels anchored in the bay are required to take the same precautions as above, and all lighters must be removed from the side at night.

4. The fumigation of all parts of the vessel simultaneously without cargo. Amount of sulphur was at first 3 pounds per 1,000 cubic feet without cargo and 4 pounds with cargo. Time of exposure, 6 to 12 hours, respectively. At the end of April this was changed to 4½ pounds sulphur and 12 hours' exposure in all cases, with the exception that living quarters were given only 6 hours.

5. Up to April 15 crews were not allowed ashore. Subsequent to this date they were permitted to land between sunrise and sunset. On June 26 masters of vessels were given permission to go ashore at all times.

6. Personal health certificates, to the effect that the party interested had not been within the infected zone for a period of seven days, were issued from March 7 to April 15. After that date only inspection of passengers and the taking of temperature of second-class and steerage passengers was required.

7. First-class passengers in transit were not allowed ashore until April 16, when they were permitted to do so between sunrise and sunset. Second and third class passengers in transit have not been allowed ashore at any time.

8. No cargo liable to harbor rats has been allowed aboard unless passed by an inspector or fumigated.

9. Fruit coming from noninfected points in crates not rat proof was allowed to be loaded, subject to inspection. The fruit must not be stored in Habana, but must be loaded direct from the cars to the vessels from approved wharves, or by means of lighters loading from the same.

SANITARY MEASURES.

Sanitary measures throughout the island of Cuba are under the control of the department of health and charities, the head of which is a cabinet officer. The secretary of this department, which is in truth a department of public health, is at present Dr. Enrique Nunez, a physician of ability. The actual work of sanitation, however, is in charge of the director of health, Dr. Juan Guiteras, and a very capable corps of assistants.

The sanitary measures put in force during the present outbreak of plague are directed primarily against the rat and flea and may be considered under the following headings:

INSPECTION.

The relation existing between the inhabitants of Habana, the hospitals, and the medical profession is such that thorough inspection is facilitated. The Spanish-born population of Habana maintains its original provincial character by becoming affiliated with social and mutual aid societies, named after the Spanish Provinces from which they come. We thus find the Gallego center, the Asturian center, etc. In addition to these regional centers, or societies, there is a rich and powerful organization known as the Association de Dependientes (Association of Employees), to which all Spanish and

Cuban employees are eligible to membership, although it is largely made up of the former. The three associations mentioned have a combined membership of about 75,000 men. The importance of these centers from a sanitary point of view is that all these organizations maintain excellent hospitals and dispensaries for the benefit of their members, who, when ill, are only too glad to at once report to the medical officers in charge for treatment.

Citizens of Cuba not affiliated with the above-mentioned societies when ill are entitled to the benefits of the State dispensaries, maintained by the State under the direction of the department of health and charities. The sanitary inspectors of this department respond to the calls made upon them by those in need of medical assistance and investigate reports of disease made by the police authorities, taking such action as the case may demand.

The well to do are, of course, treated by their own physicians, who, in accordance with the sanitary laws and regulations, must at once report to the health authorities all cases of communicable diseases. In the present instance strict enforcement of these regulations is made possible by the almost unanimous interest and cooperation of the medical profession of Habana, which is working in entire accord with the department of health, and which, if anything, is at times too quick in reporting suspicious cases.

From the above it will be seen that inspection is thorough and well under control of the sanitary authorities. All suspicious cases are at once removed to one of the " quintas de salud " above mentioned or to Las Animas Hospital. Under no circumstances are cases of quarantinable diseases treated at their homes.

DIAGNOSIS.

The definite diagnosis of cases of an epidemic disease is secondary only in importance to a well-established inspection service, in fact it is of equal importance in epidemiological work. This is well provided for in Habana. All cases of illness of a suspicious nature are reported to the director of health, who at once convenes a legally appointed board known as the commission of infectious diseases.

A diagnosis of plague is never made on the clinical symptoms alone; one or more of the other factors must be positive. With the diagnostic work in the hands of competent men the chances of error are small, but they may occur and in fact have occurred in one or two instances. In each of these cases the commission has demonstrated its sincerity and frankness by revising its diagnosis.

DERATIZATION.

Since the first outbreak of plague in 1912 deratization has been constantly practiced in Habana. Two weeks prior to the recognition of the first case in the present outbreak it was extensively carried on, due to the reports of the finding of dead rats by the sanitary inspectors. The work has been actively pushed up to the present time and all rodents caught or killed are examined for plague in the laboratory of the health department. Over 70,000 rats have been examined since 1912, and only 2 found plague infected, both during the present outbreak, the first on April 17, the last on April 24.

RAT PROOFING.

Habana has the advantage that its buildings are to a great extent rat proof in structure or can be easily made so. During the outbreak of plague in 1912 almost the entire commercial district was rat proofed. This work is now being actively pushed whenever it is required in the infected area or elsewhere.

In accordance with an order recently issued and applicable throughout the island of Cuba, a fine will be imposed on any person on whose premises rat holes or runs are found. The order goes into effect six months after date of publication.

In connection with deratization and rat proofing it is interesting to note that the sewerage system of Habana is now practically completed and was put in operation on March 1, 1913. It is one of the most complete systems ever devised, and the cost of the entire work when finished, including the conduits for surface drainage, will amount to about $23,000,000.

A few of the former sewers in old Habana draining into the harbor are still used in part. They are closely connected with the main infected district and it is quite possible that they harbor rats. They have been thoroughly fumigated, but it is the intention of the sanitary authorities to open them up so as to get an exact idea of conditions therein.

While the sewerage and drainage systems are excellent in construction and will serve to advance the general sanitary conditions of the city, the best results can not be expected as yet, for the reason that the house connections are faulty. This is now being attended to. Of the 20,000 houses in Habana, 5,000 have been examined, and when the connections were not properly made the defects have been removed. The work of inspection will continue until all connections are made sanitary.

DISINFECTION.

The agents for this purpose are hydrocyanic acid gas, sulphur dioxide, chloro-naphthol, Hyco, steam, and fire. In fumigation work HCN has given excellent results and is preferred to sulphur dioxide. The method employed in its use is as follows:

The capacity of the space to be fumigated is first calculated, and the amount of KCN and H_2SO_4 required determined in accordance with the following standard:

For every cubic meter 20 grams KCN, 40 grams H_2SO_4, about 100 grams H_2O. The KCN is then divided into convenient parts and each inclosed in three thicknesses of manila paper. A number of earthenware or, better, wooden vessels corresponding to the number of packages of KCN to be used are then provided and distributed about the building. Into these vessels is poured the aqueous solution of H_2SO_4. All openings having been closed except that of exit for the operators, the packages of KCN are thrown into the receptacles containing the H_2SO_4, the operators retreating toward the exit, which is sealed when the last receptacle is put in operation. The time of exposure varies from 6 to 12 hours, usually the latter.

The success of the operation without harmful results to the operators is based on the paper packages of KCN. As before stated the chemical is protected by three layers of manila paper bagging, great care being taken that there are no holes in the paper, and by actual laboratory experiment it has been determined that from 20 to 25 minutes will elapse before the H_2SO_4 destroys the paper envelope and the chemical action begins setting free HCN gas.

This gives ample time for putting in operation the number of receptacles necessary even in large and irregular buildings. The amount of KCN in the packages varies according to the amount and distribution of the space to be fumigated. Packages ordinarily contain 1, 5, 10, or even 20 kilograms of KCN. In actual practice the best and cheapest receptacle has been found to be the wooden barrels used for packing lard.

The effects of HCN fumigation are striking. No living thing seems to escape its lethal action, while inanimate matter is left unscathed. Merchandise, silks and satins, metals, foodstuffs, none are in any way injured by its presence. It is an ideal substance for fumigation, when plague or yellow fever are concerned, but its germicidal power is weak.

For fumigating small spaces, such as rat holes, runs, and caves, Dr. Hugo Roberts, chief quarantine officer of Cuba, has devised a simple, cheap, and efficient apparatus. It consists of a wooden box, 12 inches by 4 inches, with a false bottom with two circular openings into which are inserted two 1,000 cubic centimeter bottles with rubber stoppers, each perforated with two openings to permit the passage of the glass tubing connecting the two bottles and each in turn to the rubber bulb and the outlet tube, to which, for convenience a glass nozzle may be attached.

The bottle to which the rubber bulb is connected is charged with H_2SO_4 diluted with two or three times its volume of water. The bottle to which the rubber tube and glass nozzle is attached is charged with powdered KCN. By means of pressure on the bulb the acid solution is forced into the bottle containing the cyanide. Chemical action is at once set up and HCN gas rapidly evolved, passing out through the glass nozzle which has been previously inserted into a rat hole, the open space around the nozzle having been sealed with a dash of cement mortar.

The box is fitted with a movable handle which serves several purposes, to wit: (1) For convenience in carrying about; (2) to facilitate the removal of the bottles for recharging; (3) to serve as a rest for the exit tube in order to avoid kinks and the consequent interference with the escape of the gas.

The apparatus may be made of any convenient size. For small rat holes the size above described is used; for larger holes bottles having a capacity of 5,000 cubic centimeters are employed. In the larger size the air tube is attached to a bicycle pump instead of the rubber bulb.

Larger sizes than this have not been used, but if necessary it seems quite possible to greatly enlarge the instrument up to the size, let us say, of the ordinary formaldehyde autoclave, placing it on a truck or carriage so that it can be carried about with ease.

The small apparatus is charged with 150 grams of H_2SO_4 diluted with two or three times its volume of water, and 300 grams of powdered KCN. This is calculated to yield 10 cubic meters of 2.7 per cent HCN gas.

The apparatus is now extensively used in the antirat campaign in Habana.

Sulphur dioxide is used principally for fumigating sewers and for the purpose of determining their connections with rat runs and caves. Steam is employed in the disinfection of bedding and clothing, etc., at Las Animas Hospital.

Fire as previously mentioned in this report was used to destroy in its incipiency the focus in the stables of the department of public works. Six cases were infected here, and as it was impossible to disinfect these stables by ordinary methods, they were ordered to be burned under the direction of the fire department.

Chloro-naphthol and Hyco are utilized for washing floors, walls, etc. The germicidal power of the latter preparation has been standardized according to the methods employed by the United States Public Health Service and found to be 8 to 10 times stronger than carbolic acid.

The modus operandi in the disinfection of a building is as follows: (1) Fumigation with HCN gas; (2) diligent search for rat holes, which when found are fumigated with HCN with Dr. Roberts's apparatus; (3) tracing rat holes, for which purpose, if necessary, floors and walls are removed or opened; (4) washing floors and walls with chloro-naphthol or Hyco; (5) inundation with mild solution of chloro-naphthol or Hyco; (6) rat proofing.

It is interesting to note that no secondary cases have occurred after the disinfection of a locality.

DEPOPULATION AND SANITARY CORDON.

One of the most striking features of the antiplague campaign in Habana has been the depopulation of 17 blocks in the center of the commercial district of the city and the throwing of a military cordon about this zone, within which were located the two principle foci of infection. The depopulation was carried out under the authority of a section of the Sanitary Code, which empowers the health authorities to close any house, building, or establishment which is considered dangerous to the public health.

The depopulation was practically completed within 24 hours. Nothing was removed from the zone. The well to do were allowed to go where they pleased after leaving their new address with the sanitary department. Those who were in want, or could not afford to move elsewhere, were sent to the quarantine camp at Trisconia and there maintained at the Government's expense.

The entire zone was then disinfected block by block, including the sewers connected therewith, beginning at the point farthest from the harbor and advancing toward the water front. That portion between the lower end of the zone and the wharves was also fumigated. All buildings not rat proof were made so. Three weeks elapsed before the zone was opened up and the inhabitants allowed to return.

Taking everything into consideration, the work of depopulation was carried out without undue friction. Of course, there were a number of violent objectors, upheld by a small portion of the press; but on the whole the people affected took the matter sensibly and with good humor.

INTERNAL QUARANTINE.

No restrictions were placed on personal travel. Coastwise vessels are fumigated at Habana and all freight capable of harboring rats fumigated, except such freight as might be certified as coming from interior noninfected points and loaded directly from a rat-proof wharf.

OUTGOING QUARANTINE.

Vessels leaving for foreign ports are fumigated for rats by the Cuban authorities on request. The Cuban quarantine regulations require the fumigation of all vessels that have docked at Habana and are bound for Cuban ports. Such vessels are fumigated in the stream immediately before sailing. Hydrocyanic acid gas is used for this purpose with excellent results. Vessels bound for the United States via Cuban or foreign ports are fumigated with sulphur by the Cuban authorities, under the supervision of this service, and a certificate to that effect is issued.

Outgoing quarantine measures for vessels leaving direct for the United States are in charge of service representative at Habana and are described at length in another part of this report.

CLINICAL NOTES ON PLAGUE AS OBSERVED IN HABANA.

With four exceptions all the cases of plague in Habana, including those which developed in Artemisa and San Jose de las Lajas, were observed by the service representative at some time during the illness. Table No. VII gives the number of cases and the general data concerning each. As will be seen, there is a total of 27 cases, including the two occurring in the vicinity of Habana. The latter for all practicable purposes belong to the Habana series, the infection being clearly traced to that city. Of the total, six cases ended fatally, giving a case mortality of 22.2 per cent, which is very low, lower, it is believed, than has been registered in other known epidemics of plague.

All the cases were of the bubonic type, with the exception of No. 5, in which the bacillus pestis was found in the blood, no glandular enlargement being apparent. The case ended fatally within 48 hours. Of the bubonic cases, all were of the femoral or inguinal variety save two, in which the axillary glands were involved. In one of the latter cases the axillary bubo was followed by involvement of the cervical glands near the angle of the jaw, and, strange to say, of the opposite side. This case terminated fatally within 72 hours. In one case, No. 11, the initial bubo appeared in the glands above Poupart's ligament.

In the remaining 24 cases the bubo first appeared in the femoral region. Later, however, as the disease progressed, the inguinal glands above Poupart's ligament became involved, and in the majority of the cases the surrounding cellular tissue showed distinct signs of infiltration. As a rule the buboes were very painful and tender to the touch. With two exceptions, the buboes suppurated and were opened, the healing process thereafter being long and tedious. There have been no cases of pneumonic plague.

Clinical charts of three typical cases are herewith appended. In some of the first cases a disassociation between the pulse and temperature, such as occurs in yellow fever, was observed. A study of the entire series of cases shows, however, that this symptom is not at all constant. Albuminuria was present in all the cases. The amount of albumen was greater than that found in the hyperpyrexia of typhoid and malarial fever, and the presence of epithelial casts shows that the kidney is seriously involved. The amount of albumen, however, never even approaches that found in yellow fever, with the same febrile movement—that is, from 39.5° to 40.5° C.

As in other acute infectious diseases, plague may manifest itself in a very mild form, and may be entirely overlooked unless all means at command are exhausted before determining the diagnosis. Cases Nos. 2 and 26 of the Habana series are excellent examples of this. In both it was only by painstaking inoculation and cultural tests that the true nature of the disease was finally established.

TREATMENT.

The treatment has consisted of the intravenous administration of massive doses of Yersin serum, 80 cubic centimeters being administered twice daily during the first three or four days of the disease, or, in fact, so long as the temperature remains above 39° C., the doses diminishing gradually as the temperature falls. Over 500 cubic centimeters of Yersin serum have been administered to one case in divided doses. The height of the temperature is the guide for the quantity and frequency of serum administration. After suppuration has occurred and the temperature is wholly or in part due to this process, the fever no longer serves as a guide, and in fact it is found better then to stop the serum altogether. The ill effects of these large doses of serum are counteracted by the administration of calcium chloride, one or two grams daily.

This treatment has given excellent results, as may be seen from the case mortality, which is, as before stated, but 22.2 per cent.

Other general symptoms are treated as they arise. Depression by stimulants, principally strychnia; irritability and other cerebral symptoms by anodynes, particularly drop doses of tincture opii; diminished renal activity by means of urotropin. Warm wet applications are applied to the bubo, which is opened so soon as suppuration is apparent.

VERA CRUZ, MEXICO.

The transactions of the United States Public Health Service at the port of Vera Cruz, Mexico, for the period April 4, 1914, to June 30, 1914, have been as follows:

Sailing vessels inspected	2
Steam vessels inspected	26
Numbers of crews inspected	2, 156
Numbers of passengers inspected	3, 019
Bills of health issued without inspection to United States ships	45
Steam vessels inspected and fumigated; mosquitoes	24

HONGKONG, CHINA.

Surg. W. A. Korn reports as follows:

Bills of health were issued to 460 vessels, carrying 10,048 cabin passengers, 19,300 steerage, and 45,656 crew.

One thousand five hundred and forty-nine steerage passengers and 1,594 members of crew were bathed, and 18,152 pieces of baggage were disinfected; 146 vessels were fumigated with sulphur and 848 rats killed. The crews' quarters on 460 vessels were disinfected with either formaldehyde or sulphur. The following list of cargo was either stored or disinfected:

	Disinfected.	Stored.
Human hair . . . cases	836	
Bristles . . . do	29	
Hides . . . pieces	13,601	
Feathers . . . bales		3,074
Bonemeal . . . bags		36,313
Old embroideries . . . cases	4	

Eight hundred hides (pieces) dried and arsenic cured were not disinfected.

The rat reports from the colonial government give a total of 104,544 rats caught during the fiscal year, and of this number 707 were plague infected. The following communicable diseases were reported during the fiscal year:

	Cases.	Deaths.
Bubonic plague	2,288	1,825
Enteric fever	184	67
Asiatic cholera	120	57
Smallpox	101	80
Diphtheria	90	23
Puerperal fever	13	6
Cholera nostra	2	2
Paratyphoid fever	2	
Relapsing fever	1	

A small epidemic of cholera (116 cases) broke out in August, 1913, mostly on board fishing and cargo boats belonging to the village of Shaukiwan. The epidemic continued through September and October and then ceased. In March, 1914, the steamship *On Sang* arrived from Singapore with cholera aboard. Sixteen cases were isolated in quarantine, the vessel disinfected, and no further cases occurred. In 1912 an epidemic of plague (1,947 cases) occurred in the colony. The medical officer of health attributed this epidemic to the overcrowding which had resulted from the influx of Chinese from the neighboring provinces, and which is believed to have led to a large increase in the rat population of the inhabited districts. This epidemic was followed by a year in which the plague incidence was light, 408 cases being reported during 1913, possibly due to the fact that a large proportion of the remaining rats were immune. Another large influx of Chinese to the colony during the latter part of 1913 was followed by the present epidemic in 1914, in which 2,056 cases were reported with 1,450 deaths.

At the present writing the epidemic is rapidly subsiding, 37 cases having been reported during last week of June. Following are the nationalities of cases: Indian, 23; Japanese, 13; Malay, 10; Filipinos, 8; British, 7; Portuguese, 5; English, 2; Scotch, 1; African, 1; Hindoo, 1; Parsee, 1; Javanese, 1; Eurasian, 1; and the rest Chinese.

The usual methods for the prevention of plague have been employed, rat-proofing buildings, the collection and bacteriological examination of dead rats, destruction of rats by poison, traps and birdlime boards, systematic cleansing and washing out of all native dwellings at least once in three months with kerosene emulsion, daily garbage removal, and the disinfection of plague infected premises by washing with kerosene emulsion. All bedding, clothing, carpets, rugs, etc., are disinfected with superheated steam. Wholesale rat poisoning has been abandoned as a futile measure. During the epidemic of plague, the closest supervision of passengers, crews, and cargo has been exercised. So far as known at present, plague developed on but one vessel bound for American ports. The steamship *Korea* was quarantined at Shanghai three days after leaving Hongkong with two cases of plague. During the year 3 cabin passenger 86 steerage, and 17 crew were removed from vessels at the regular inspections suffering from fever. Two members of crew were also removed from vessels suffering from measles.

KOBE, JAPAN.

Acting Asst. Surg. Alan Richardson reports as follows:

TRANSACTIONS.

Steam vessels inspected and granted bills of health	335
Sailing vessels inspected and granted bills of health	3
Total bills of health granted	338
Passengers on the above vessels inspected	35, 039
Crew on the above vessels inspected	44, 356
Pieces of baggage disinfected	414
Number of persons bathed and their effects disinfected	309
Vessels fumigated	46
Pieces of freight inspected and disinfected	6, 803

Manifests viséed for 185,288 tons of cargo.

Consular bills of health were issued to 338 vessels, of which 41 were original and 297 were supplemental.

The crews and passengers of all these ships were inspected at the time of their departure. Twenty cases of infectious diseases were discovered on ships in this harbor, as follows: Smallpox, 2; cholera, 9; leprosy, 8; measles, 1.

Forty-six ships were disinfected with sulphur dioxide gas for the destruction of rats.

Every precaution was taken to prevent the access of rats to ships, rat guards being used on lines to lighters when loading and discharging cargo, and all lighters used to convey cargo to ships were subjected to frequent deratization by sulphur fumigation.

All cargo of a character likely to attract rats, or afford a nesting place for them, such as peanuts and grain, was required to be stowed in rat-proof godowns and packed in new bags before shipment.

Inspection and supervision of cargo godowns was made with a view of eliminating rats. Shipping orders, or boat notes, for cargo destined to the United States were required to be submitted for approval and signature before loading. All lighters conveying cargo to the vessels were fumigated and a certificate issued, and no ship was permitted to receive cargo from any lighter that did not have a certificate. All manifests of cargo were viséed. In this way a complete check is kept of every item of cargo leaving Kobe for United States ports.

Two cases of cholera occurred on board the steamship *Canada Maru*, en route from Hongkong to Tacoma via Japan ports.

These cases were discovered among the steerage passengers at Nagasaki, and the ship proceeded to Kobe, where she was placed in quarantine for five full days. Necessary precautions were taken under the supervision of harbor authorities in this port. Later nine more cases were reported on board. The ship was detained in quarantine for another six full days, fumigated with sulphur dioxide gas, the passengers and crew bathed, and their effects disinfected with steam. All stores were removed and the storerooms were washed with mercuric chloride solution. The compartments for passengers and crew and the decks were washed down and sprayed with a solution of carbolic acid and no further cases occurred.

The steamships *Siberia* and *Manchuria* arrived at Kobe from Hongkong via Nagasaki, each having a case of smallpox on board. The cases were removed, direct contacts isolated, the ships disinfected, crew and passengers vaccinated, and their bedding and effects disinfected. No other cases developed on the above-mentioned ships.

Sanitary conditions, city of Kobe.—The population of Kobe, according to the census taken June 30, 1914, was 469,262.

The registered births were male, 4,774, and female, 4,684, making a total of 9,458. The birth rate for 1913, based on the new census figures, was 21.50 per 1,000, while the death rate showed 19.40 per 1,000.

During the fiscal year this port remained unusually free from quarantinable diseases, only 5 cases of bubonic plague and a case of smallpox having been reported in Kobe. But from last October to March of this year several plague-infected rats were found daily. No cases of cholera occurred.

Owing to the serious epidemic of typhus fever in Tokyo districts, the Kobe office was notified by Surg. B. W. Brown, of Yokohama, suggesting special regulations for the ports of Kobe. All steerage passengers and second-cabin passengers (who came from or have visited Tokyo or other infected territories) destined for the United States or Manila, P. I., were isolated and kept under observation for 12 days before they were permitted to embark. The steerage passengers and second-class passengers were bathed and their effects disinfected with steam. Communication between ships and the shore was kept at a minimum.

The official report of communicable diseases which appeared in Kobe during the fiscal year ending June 30 are given as follows:

	Cases.	Deaths.
Dysentery	500	137
Typhoid fever	330	84
Diphtheria	179	72
Paratyphoid	105	24
Scarlet fever	54	2
Plague	5	3
Smallpox	1	....
Tuberculosis	(1)	791
Total	1,174	1,113

(1) Unknown.

Sanitary conditions, Empire of Japan.—Plague: Twenty-seven cases with 20 deaths were reported during the year.

Cholera: There were 78 cases of cholera with 22 deaths.

Dysentery: This disease shows much decline, there being 16,779 with 3,691 deaths.

Typhoid fever: Of this disease there were reported 27,717 cases and 5,443 deaths.

Diphtheria: Nineteen thousand one hundred and thirty-seven cases and 5,011 deaths were reported.

Leprosy: No definite data of the number of cases of leprosy is obtainable.

About 35 per cent of persons who were examined for hookworm and about 30 per cent of those examined for trachoma were found to be infected.

LA GUAIRA, VENEZUELA.

Acting Asst. Surg. W. J. S. Stewart reports as follows:

During the past fiscal year there have been no cases of quarantinable disease either in La Guaira or in Puerto Cabello. In Caracas there have been no cases of yellow fever originating in that city, those occurring having been brought in either from Valencia or some other locality. Very few cases of plague have occurred in Caracas, due in all probability to the rat campaign which has been carried out in that city. It is stated, however, that the measures against rats in Caracas are not as effective as they might be.

In La Guaira no steps have been taken to reduce the number of rats. While the breakwater piers in that city are not infested with rats, many rodents are observed in the large buildings and along the shore. The same is also true of Puerto Cabello, where it is reported that rats may be seen at night playing along the ledges of the customhouse windows.

Many mosquitoes breed in Puerto Cabello, so that vessels lying alongside wharves at that port are infested with the insects. Apparently there has been no occurrence of yellow fever to a considerable extent, except in the city of Maracaibo.

Transactions.

Vessels inspected and passed	131
Passengers and crews inspected	18, 457

The following table shows the occurrence of yellow fever in Caracas during the fiscal year:

Yellow fever in Caracas during fiscal year 1914.

	Cases.	Deaths.
1913.		
January	2	0
February	1	0
March	0	0
April	0	0
May	1	[1]0
June	0	0
July	1	1
August	0	0
September	0	0
October	1	[1]0
November	0	0
December	0	0
1914.		
January	0	0
February	3	[1]3
March	1	[1]1
April	0	0
May	0	0
June	1	1
Total	11	6

[1] Imported.

Of which number five cases occurred this past six months, and of which number seven cases and six deaths occurred during period July 1, 1913, to June 30, 1914.

As will be seen, almost all the cases were imported.

There have been no special outbreaks of malarial fevers during the year—nothing like the year before—but in September, 1913, there was a very severe outbreak of dysentery at Biscucuy which lasted for one month or thereabouts, ending about October 7, 1913. The next month there was an outbreak of dysentery in Carayaca, and this was soon eradicated. Also, in May, 1914, there were some cases at Bocono which proved to be a mild outbreak. The department of sanitation has been using in the treatment of dysentery occurring in outbreaks the chlohydrate of emetine with reported excellent results.

PLAGUE IN VENEZUELA.

The last true case of plague in Venezuela was reported from Las Flores, about 50 miles westward of Caracas on the English railway, on April 6, 1914. The department of health did excellent work in preventing the spread of this disease in the little towns and villages adjacent to this place.

In this case the infection could not be traced, as the patient had not been out of his own town for months. In all probability an infected rat was brought there.

The total rat catch for the fiscal year, as reported in the Caracas bulletin of the health department, is a trifle over 14,000, of which number none was found to be infected with plague. Rat catching and examination goes on very slowly in La Guaira. At present it is doubtful if any examination of rats is being made.

MORTALITY IN FISCAL YEAR 1914—LA GUAIRA.

Total for the year, 354 deaths. Population estimated at from 9,000 to 10,000. Includes the neighboring towns of Macuto and Maiquita, with which latter it is practically continuous, and is connected by electric tramway with both towns.

Meningitis—not the cerebrospinal variety, although reported as such—caused 11 deaths; tuberculosis, 81 deaths; cancer, 12; dysentery, 27 (not all the amebic variety); intestinal diseases (small intestine is meant), 43; typhoid fever, 16; leprosy, 1; infantile tetanus, 13; malarial fevers, 7; pneumonia, 4; tetanus (not infantile variety), 2; and hookworm, 3.

There was not during the year a single death in La Guaira from yellow fever, and there were very few cases. One occurred in June, 1914, in the person of a German who left Maracaibo on a Monday and arrived in La Guaira on the second day, Wednesday, went at once to Macuto, and was taken ill on Saturday evening. This is mentioned on account of the disease appearing on the evening of the sixth day, as there was no doubt of the infection having been received in Maracaibo—at least so little doubt that it might be eliminated from the case.

NAPLES, ITALY.

Surg. J. M. Eager reports as follows for the fiscal year ending June 30, 1914:

Statistics of the service at Naples, Italy.

Months.	Ships.	Emigrants.		Baggage.	
		Inspected.	Embarked.	Inspected.	Disinfected.
1913.					
July	27	21,615	20,664	2,600	25,250
August	26	18,381	17,754	2,545	22,820
September	24	19,299	18,655	2,740	23,040
October	27	18,006	17,284	3,380	23,140
November	28	13,507	12,828	2,900	18,840
December	18	5,938	5,612	1,956	7,367
1914.					
January	22	4,663	4,486	2,861	4,287
February	17	7,655	7,414	2,878	8,651
March	29	20,374	19,877	6,703	19,585
April	30	22,175	21,571	6,250	21,622
May	26	12,281	11,964	5,075	11,976
June	24	4,849	4,718	3,156	5,503
Total	298	168,743	162,827	43,044	192,081

Rejections recommended.

Months.	Trachoma.	Favus.	Suspected trachoma.	Measles.	Smallpox.	Other causes.	Total.
1913.							
July	396	20	326	1		208	951
August	281	23	181		3	139	627
September	308	22	191			123	644
October	350	23	207			142	722
November	403	14	158			104	679
December	191	13	89			33	326
1914.							
January	128	7	20			22	177
February	129	3	60			49	241
March	287	12	130			68	497
April	327	18	159			100	604
May	170	8	78			61	317
June	62	5	37			27	131
Total	3,032	168	1,636	1	3	1,076	5,916

Comparison with last 2 years.

Year.	Emigrants.		Baggage.		Rejections recommended.
	Inspected.	Embarked.	Disinfected	Passed.	
1911–12	120,276	116,181	165,329	15,677	4,095
1912–13	178,407	168,189	224,550	23,480	10,218
1913–14	168,743	162,827	192,081	43,044	5,916

Statistics of the service at Messina, Italy.

Months.	Ships.	Emigrants.		Baggage.	
		Inspected.	Embarked.	Inspected.	Disinfected.
1914.					
May	6	220	207	218	224
June	3	52	48	13	55
Total	9	272	255	231	279

Rejections recommended.

Months.	Trachoma.	Other causes.	Total.
1914.			
May	11	2	13
June	2	2	4
Total	13	4	17

TYPHUS FEVER IN THE LEVANT.

In view of information indicating an extensive spread of typhus fever in the eastern ports of the Mediterranean, active vigilance has been practiced to prevent persons carrying the contagion of that disease departing for American ports, and, since the middle of April, numerous persons suspected of being in contact with the disease or likely to convey it, have, with the cooperation of the Italian authorities, been sent to the official detention house, placed under observation for 12 days, their effects disinfected and their persons freed from vermin.

CHOLERA IN THE LEVANT.

Bills of health have been granted as during previous years to all vessels leaving Naples for the United States, including inspection of all steerage passengers with a view to detecting conditions of health that might influence the admission of such passengers at ports of the United States under the immigration laws.

With the cooperation of the Italian Government all persons from the Levant contemplating departure for the United States have been as a precaution against cholera held in a detention house at Naples for a period of five days, then bathed, their effects disinfected, all foodstuffs confiscated and bacteriological examination made to exclude carriers.

SHANGHAI, CHINA.

Acting Asst. Surg. S. A. Ransom reports as follows:

The work of the station as a whole, for the fiscal year just ended, shows an increase as compared with last year.

During the year 20 cases of illness were investigated on board vessels taking bills of health for the United States. The only quarantinable diseases met were two cases of plague on the steamship *Korea.*

As previously reported, an outbreak of plague, two cases, both bacteriologically confirmed, with recovery in each instance, on the Pacific Mail Co.'s steamer *Korea* early in May caused some anxiety, but the disease being discovered very early and the measures to meet the emergency being prompt and energetic and disease was eliminated from the vessel without further spread.

The duties of the officer in charge of this station include the issue of bills of health to all vessels bound to American and Phillipine ports, prior to granting which inspections are made on board, except of naval vessels, in which cases the certificate of the medical officer that the vessel is free from communicable disease is accepted as sufficient grounds for the issue of bills of health without inspection. This latter class of vessels is included under the head of "vessels spoken and passed."

In addition to the above-mentioned duties, vessels, personnel, and cargo requiring such treatment are disinfected or fumigated to render them free from danger of conveying infection. Included in this are lighters used to convey cargo to vessels bound to the United States or Philippines. The officer at Shanghai is also frequently asked by the United States naval authorities in Chinese waters to advise with regard to quarantine precautions to be adopted when communicable disease appears on board the war vessels and to supervise the measures taken for disinfection; also to supervise rat destruction on some of the vessels; all of which duties are promptly undertaken.

Cargo destined for United States ports is closely supervised by means of inspection in process of packing, and disinfection or special packing or stowage is enforced when necessary. No cargo is placed on board vessels until the boat permit or "shipping order" has been signed by this office.

Vessels loading for United States ports are required to anchor in the stream and to work cargo, as far as possible, only in daylight. Foreign-owned lighters alone are allowed to be used, and the lines to these must be protected with rat guards. In the case of any vessel failing to observe these rules, a notation is made on the bill of health recommending fumigation or disinfection at the first port of entry into the United States. The lighters are practically all steel craft, and are fumigated with sulphur gas periodically under service supervision to free them from rats. The number of lighters fumigated during the year was 252, and the number of rats found dead on board same 215.

The bathing, etc., of personnel has by bureau order been limited to those vessels bound direct to Philippine ports and those actually infected; hence there has been a decrease in the work done in this direction.

With regard to the health of the settlement, the table shows those communicable diseases which have been officially reported.

Cholera, smallpox, plague, and leprosy are endemic, and there are frequently epidemics of the two first-mentioned diseases in and about Shanghai. Typhus fever and plague occur sporadically, and typhoid fever and relapsing fever, malarial fever, and dengue fever are frequently met with. Dysentery and sprue are very prevalent. Yellow fever is at present unknown there. The specific mosquito necessary for its conveyance from man to man is present at all times, nor will it ever be practicable to remove this insect, because the very lives of the population depend upon supplying the conditions under which mosquitoes thrive, viz, the raising of rice in shallow ponds. Mosquitoes are a veritable pest in the vicinity of Shanghai. Beriberi and elephantiasis are frequently met with. Rabies is prevalent among dogs, and there are frequently human cases of this disease. Rinderpest, foot-and-mouth disease, and anthrax claim their share of victims among the animals, and anthrax occasionally appears among the human handlers of hides, skins, wool, etc.

The climate is characterized by very high humidity, especially in the warm weather, and a temperature which varies from about 40° F. in the winter (occasionally dropping for a brief interval to the freezing point) to 99° to 103° F. in the summer.

Transactions.

Vessels spoken and passed	13
Steamers inspected and passed	157
Steamers disinfected	8
Number of crew on steamers	19,981
Number of passengers on steamers	12,294
Number of bills of health issued	169
Number of persons bathed	685
Number of pieces of baggage disinfected	685
Number of pieces of freight viséed	842,830
Freight disinfected and certified	19,492
Vaccination certificates	10

Table of morbidity and mortality in Shanghai, 1913–14.

Months.	Cases among Europeans (population, 14,300).					Deaths among natives (population, 520,000).						
	Smallpox.	Typhoid fever.	Diphtheria.	Scarlet fever.	Tuberculosis.	Smallpox.	Diphtheria.	Scarlet fever.	Tuberculosis.	Plague.	Rats, plague.	Rats examined.
July	0	2	2	10	0	3	9	10	70	0	0	0
August	2	1	1	4	0	1	1	10	127	0	0	0
September	0	11	0	2	0	0	0	3	80	0	0	0
October	0	7	2	5	0	3	3	3	69	0	8	888
November	0	5	15	9	2	0	12	6	98	0	20	1,267
December	2	1	2	0	0	1	9	6	78	0	13	1,161
January	3	2	7	2	0	5	10	6	92	0	5	595
February	7	6	5	3	0	10	7	15	75	0	7	962
March	8	8	10	4	3	20	25	30	122	0	18	1,483
April	6	6	8	10	0	23	4	24	79	1	25	1,080
May	5	8	2	10	0	18	3	35	99	0	19	1,452
June	3	3	2	0	1	7	6	17	74	0	6	985
Total	36	60	56	59	6	91	89	165	1,063	1	121	9,873

MEDICAL INSPECTION OF IMMIGRANTS.

During the fiscal year ended June 30, 1914, 1,485,957 immigrants were examined by the Public Health Serivce to determine their physical and mental fitness for entrance at ports in the United States and its dependencies, Porto Rico, Hawaii, and the Philippines. Of this number, 41,250 were certified for physical reasons.

While practically nearly every officer in the Public Health Service has taken more or less part in this work, 87 medical officers (33 commissioned officers and 54 acting assistant surgeons) were assigned to this work exclusively.

As usual, the officers of the service stationed in the American consulates in foreign ports have made inspections of departing aliens, at the request of the Department of Commerce, in connection with their quarantine inspection of steerage passengers destined for United States ports. The function, however, of medical officers stationed in foreign ports is not to reject aliens found suffering from any of the mental or physical diseases deportable under the immigration laws of the United States, but merely to notify the proper authorities in the foreign ports that immigrants suffering from these diseases are liable to be deported upon their arrival in the United States.

The past year has marked a great improvement in the methods of examining immigrants upon their arrival. Not only have the facilities for this work been notably increased, but the methods adopted in the medical examinations have been greatly reorganized and systematized, and the result is shown in the increase of certifications for the past fiscal year over those for the year ended June 30, 1913. In the last-named year 38,588 immigrants were certified, while in the year ended June 30, 1914, 41,250 were certified. Especially is this increase noticed in connection with certificates rendered for mental deviation, including insanity, idiocy, imbecility, epilepsy, and feeblemindedness, 883 aliens having been certified in the year ending June 30, 1913, as against 1,360 certified during the fiscal year 1914. Increases in transactions occurred in the certification of such diseases as trachoma, tuberculosis, syphilis, and gonnorrhea.

At the Ellis Island Immigration Station, where 1,009,854 immigrants were inspected, the percentage increase per 100,000 immigrants in connection with the certification of mental defectives is interesting. During the fiscal year 1912, 19.6 per 100,000 were certified. In 1913 the percentage increased to 50.8 per 100,000, while during the fiscal year ended June 30, 1914, 96 per 100,000 were certified, indicating an increase of 88.9 per cent over 1913. At the present time a medical officer of the service is engaged in the mental examination of a large number of normal immigrants of various races and nationalities with a view of obtaining data to be put to practical use in improving the methods of examination of supposed defectives.

A well-equipped bacteriological laboratory is now in operation at the Ellis Island Station, in charge of an expert medical officer and the proper assistants. In addition to the diagnostic and thereapeutic aid rendered to the two immigrant hospitals by this laboratory, autogenous vaccines are made, and blood cultures and the diagnostic inoculation of animals are carried out.

A female acting assistant surgeon has been attached to the medical complement at this station for duty in the examination rooms for women and it is thought that this measure will result in the practical rendering of critical examinations of female immigrants who are turned aside from the line for further medical examination.

The medical examination work at all of the immigration stations has been inspected during the fiscal year with a view of rendering as near as possible the performance of medical work upon a uniform basis.

Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada.

	Number of aliens examined.	Aliens certified.					Important diseases for which certification was made.										
		Class A—(1) Idiocy, imbecility, feeble-minded, epilepsy, insanity, and tuberculosis.	Class A—(2) Loathsome contagious, or dangerous, contagious.	Class B—Disease or defect which affects ability to earn a living.	Class C—Disease or defect of less degree.	Total.	Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded.	Favus.	Syphilis.	Tinea tonsurans.	Gonorrhea.
Aguadilla, P. R	5																
Arecibo, P. R	4																
Astoria, Oreg	1,850	2	10	11	1	24		1	1						4		2
Baltimore, Md	40,248	5	53	441	414	913	33	1	1				5		1	17	1
Bellingham, Wash																	
Boca Grande, Fla	3																
Boston, Mass	80,322	54	85	1,134	3,285	4,558	58	7	16	1	2		29	16	6		4
Blaine, Wash	187	10	12	10	4	36	2		5			1	3		1		5
Brownsville, Tex	1,823	5	78	41	4	128	12	1				1	3				1
Brunswick, Ga	16	1				1		1									
Buffalo, N. Y	9,143	100	19	125	204	448	77	2	7	2	2	2	4	8	1		7
Calexico, Cal	545	19	2	20	6	47		18	1						1		1
Cebu, P. I	103																
Charleston, S. C	55	2	3	4		9			1				1		1		1
Chicago, Ill	46	6	1	6	5	18		4	1	1		1					
Del Rio, Tex	2,162		33	1		34						1					
Detroit, Mich	4,169	25	30	65	369	489	10	8	7			2	2				15
Douglas, Ariz	3,279	6	63	1	1	71	62	1	1	1	1	1	1				
Duluth, Minn	6,035	4	6	20	1	31	4	2	1				1		1		1
Eastport, Idaho	4,373	8	4	125	5	142	4	4	1				4				
Eagle Pass, Tex	20,673	80	130	350	220	780	9	5	1	4	2	5	2		12		
El Paso, Tex	10,814	16	16	148	30	210	2	6	6	1		1	2			9	1
Everett, Wash	153	3				3											
Farjado, P. R	2																
Galveston, Tex	7,565	11	46	373	55	485	43		2		2	1	6		1		
Guanica, P. R	12																
Halifax, Nova Scotia	10,158	5	15	192	186	398	10	1	1		1		2	1	2	1	1
Hidalgo, Tex	1,606	2	87			89	86					1	1				1
Honolulu, Hawaii	5,210	1	199	57	6	263	135						1				1
Houlton, Me	199																
Iloilo, P. I	327																

International Falls, Minn.	735		15	6		21	21	15									
Jolo, P. I	102																
Ketchikan, Alaska	623																
Key West, Fla	5,071		1	5	2	8									1		
Laredo, Tex	10,676	4	1	10	66	81	8	1			1	2					
Los Angeles, Cal	2,407																
Manila, P. I	3,056	84	1	4		89	81		1					2			
Marcus, Wash	775		1	24	5	30	1										
Mayaguez, P. R	310			4		4											
Miami, Fla	3,730	3		3	3	9			3								
Mobile (Ala.) Quarantine	614		1	2		3									1		
Montreal, Canada	13,776	42	93	369	273	777	88	33	5		1	1	2		1		1
Naco, Ariz	3,672	5	38	6	2	51	24	1				1	2		3		10
New Orleans, La	5,104	3	31	22	40	96	18	2							10		2
New Orleans Quarantine Station	1,536		1			1	1										
Newport News and Fort Monroe, Va	69																
New York, N. Y	1,009,854	1,100	1,547	19,616	953	23,216	1,214	22	110	5	64	9	890	69	5	24	20
Niagara Falls, N. Y	10,148	19	145	125	110	399	140	9	4		1	1	1		3		2
Nogales, Ariz	4,714	6	45		1	52	37	1	1				3				5
Norfolk, Va	143	1	1			2		1							1		
Pascagoula, Miss	27																
Perth Amboy, N. J	17																
Philadelphia, Pa	60,483	19	255	760	1,075	2,109	247	1	5	2		1	10	2			
Pittsburgh, Pa	3		1			1	1										
Ponce, P. R	167			4		4											
Portal, N. Dak	1,114	3	5	8	7	23	3	1	1				1				
Port Arthur, Tex	3,210	1	55		67	123	7	1							17		31
Port Huron, Mich	3,393	31	46	199	100	376	39	6	11		1	2	11	1	2		
Port Inglis, Fla																	
Portland, Me	7,845	1	23	4	44	72	23		1					1			
Portland, Oreg	33				2	2											
Port Tampa, Fla	3,207	1	1			2			1						1		
Port Townsend, Wash	13,994	1	133	56	1	191	92							1	11		29
Providence, R. I	11,251	6	24	336	221	587	24	1	1						1		
Quebec, Canada	27,552	17	53	182	110	362	44	2	6	1			10		3		4
San Diego, Cal	1,704	1	1	15	6	23		1									1
San Francisco, Cal	16,924	16	1,658	213	6	1,893	62	7	6				2	1	1		
San Juan, P. R	3,116	2	2	10	5	19		2							1		1
Savannah, Ga	7																
Seattle, Wash	3,847	4	224	4	5	237	23	2	1			1					
St. John, New Brunswick	1,019	9	4	10		23	4	7	2								
Sault Ste. Marie, Mich	3,200	5	37	58	120	220	25	1	1					4	1		2
Sumas, Wash	2,321	69	6	7	30	112	55		2						3		
Sweet Grass, Mont	312	4	1	2	10	17		1	2				1				
Tacoma, Wash	2,388	1	20	1	2	24	18								1		
Tampa Bay (Fla.) Quarantine	6,892	1	2	2	7	12	6					1			2		3
Tia Juana, Cal	4,420		26			26	18								1		
Tucson, Ariz	125	3	1	1	1	6											

Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada—Continued.

	Number of aliens examined.	Aliens certified.					Important diseases for which certification was made.										
		Class A—(1) Idiocy, imbecility, feeble-minded, epilepsy, insanity, and tuberculosis.	Class A—(2) Loathsome contagious, or dangerous, contagious.	Class B—Disease or defect which affects ability to earn a living.	Class C—Disease or defect of less degree.	Total.	Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded.	Favus.	Syphilis.	Tinea tonsurans.	Gonorrhea.
Vancouver, Birtish Columbia	7,120	6	206	163		375	174	7	2						2		4
Victoria, British Columbia	3,132	6	3	10	55	74											
West St. John, New Brunswick	1,711	1	6	6	12	25	4	1					1	1			
Wilmington, N. C	1		1			1						1					
Winnipeg, Canada	7,116	20	11	196	68	295	8	11					6	1	1		
Zamboanga, P. I	104																
Total	1,485,957	1,860	5,618	25,567	8,205	41,250	3,051	184	219	18	78	38	1,007	108	1,040	51	157

EMIGRATION FROM ITALY.

ROYAL ITALIAN DECREES WHICH GIVE INDIRECT SANCTION TO THE UNITED STATES IMMIGRATION LAWS—REGULATION FIXING THE INDEMNITY DUE TO EMIGRANTS WHO ARE REJECTED AT THE PORT OF EMBARKATION.

[Royal decree, February 5, 1914; No. 109.]

It is ordered that the following decree, provided with the seal of the State, be inserted in the body of laws and decrees of the Kingdom of Italy, and that each inspector be directed to observe it and to cause it to be observed:

ARTICLE I. All emigrants rejected at the port of embarkation who have been furnished with tickets of embarkation at their place of origin or at any other place not the port of embarkation—the right of appeal to the arbitration commission of emigration for liquidation for loss sustained being reserved—have a right to claim from the carriers who have sold them tickets of embarkation, either directly or by means of a representative:

1. Reimbursement of all and every expense incurred by them in the transportation of themselves and their baggage from their place of origin to the port of embarkation.

2. The necessary sum for the transportation of their persons and baggage to the place of origin.

ART. II. For the said indemnity established by No. 1 and No. 2 of the preceding article we have included those emigrants who have received tickets of embarkation at the port of departure when in the judgment of the inspector they have left their place of origin or last residence without ticket of embarkation on the advice, incitation, or instigation of the carrier or his agent.

ART. III. In case the emigrant is unable, for causes independent of his own volition, to leave for his place of origin on the same day on which he is rejected at the port of embarkation the carrier shall be held to furnish him with food and lodging until such time as he may make his return journey.

ART. IV. The indemnity established in the preceding articles shall be paid to such emigrants as, having been furnished with tickets of embarkation at their place of origin, can not leave on account of rejection of another emigrant in consequence of legal requirements in regard to the same.

ART. V. In case the rejected emigrant does not wish to return to his place of origin, said circumstance shall be reported verbally by the inspector of emigration, and the said emigrant shall be entitled to the reimbursement indicated in No. 1 of Article I.

ART. VI. The liquidation of the whole indemnity referred to in the preceding article shall be made to the royal inspector at the port of embarkation. The inspector shall give a receipt to the carrier for the sum released to the rejected emigrant in order that the arbitration commission of emigration may keep an account of the liquidation of the claim of indemnity of said emigrant.

ART. VII. No indemnity is due to the emigrant who is rejected at the port of departure by reason of some cause which has, in the opinion of the port inspector of emigration, supervened after the delivery of the ticket of embarkation by the carrier or his agent.

In such a case the port inspector of emigration is authorized to request the opinion of the commission of final inspection.

ARTICLE VIII: The carrier of emigrants who presents to the commission of final inspection an emigrant who is not in condition to depart independently of the requirements of the preceding articles shall be held guilty of contravention and shall be subject to a fine fixed by article 31 (line 7) of the laws of January 31, 1901 (No. 23, on emigration), when the condition which prevents the departure of the emigrant is manifest and when the same might presumably have been observed by the carrier or his agent at the time of the delivery of the ticket of embarkation.

(Signed) VICTOR EMMANUEL.

Countersigned:

GIULETTI.	TEDESCO.
A. D. SANGIULIANO.	MILLO.
FINOCCHIARO APRILE.	NITTI.
FACTA.	COLOSINO.

Done at ROME, *February 5, 1914.*

The said decree provides that emigrants who are rejected at the port of departure on account of being inadmissible to the country of destination shall be indemnified by the carriers. This measure is in line with the requirements of article 24 of the law on emigration, according to which the carriers are held to make good the loss sustained by the emigrants who are rejected at the countries of destination and constitutes an indirect sanction of the requirements of the American law on immigration which prohibits the transportation of immigrants included in the category of foreigners excluded from the territory of the Republic.

The decree was issued by the Royal Government with the object of cooperating with greater efficacy with the Government of the United States for the purpose of preventing the departure for that country of any person who, according to the American law on immigration of February 20, 1907, may not be admitted to the territory of that Republic. Accordingly it is prescribed that the carrier of emigrants (navigation society authorized to transport emigrants from Italian ports) shall pay special indemnity to those emigrants to whom they have sold tickets of embarkation who are not able to leave Italy because in the opinion of the commission of inspection of departure they are not in the condition required by the American laws of immigration for landing. It may be inferred from this that carriers of emigrants will not sell tickets of embarkation except to persons who can disembark in America.

ARTICLE I OF ROYAL ITALIAN DECREE OF NOVEMBER 20, 1902—PERSONS TO WHOM PASSPORTS MAY NOT BE ISSUED FOR THE UNITED STATES.

The said article prohibits the issuance of passports to citizens who are not in the condition desired by the immigration laws of the countries to which they are destined.

The rigid application of such requirements is especially necessary for those desiring passports for the United States. For various reasons it is indispensable that the Italian authorities give their active cooperation to the American Federal authorities in order to prevent the departure of persons belonging to the category of foreigners declared inadmissible, under the American laws, to the United States. Especially to be avoided is the departure of "persons who have committed acts involving moral turpitude; that is to say, acts showing perverted and brutal instincts and which are considered criminal not only because they are punishable by law, but also because they constitute in themselves an evil and expose the person who has committed them, even if he has not been condemned to public discredit, to loss of public respect and the esteem of good men."

Excerpts from Reports Made by Officers Detailed for the Medical Inspection of Immigrants.

BALTIMORE, MD.

Nine hundred and eighty-one vessels subject to immigration examination arrived at this port during the year, with a total of 41,330 (cabin, 2,679; steerage, 38,651) passengers. There were 40,248 aliens examined upon arrival. Of these 2,058 were cabin and 38,190 were steerage passengers. In addition to this number 1,082 were passed by the immigration authorities as United States citizens.

It will be noted that while 43 vessels less arrived during the year than during the preceding year, the increase in immigration exceeded by 13 per cent the previous year's record, which augmented the work of the station accordingly.

There were 913 certificates rendered during the year, being an increase over the preceding year of 245 for the various mental and physical defects. While the number of certificates rendered were a 40 per cent increase over the previous year, it will be observed that the number certified under the head of "dangerous or loathsome contagious" was decidedly less than the preceding year. This decrease is undoubtedly due to the more careful medical examination made at the foreign ports of embarkation in order to avoid fines and deportations, a number of the former having been imposed during the year for bringing in cases of trachoma which could have been detected by competent medical examination at the respective ports, for instance: During the past year 33 cases of trachoma were detected, as compared to 41 cases certified during the preceding year, this being a reduction of almost 25 per cent, although there was an increase of 5,000 aliens arriving last year over that of the fiscal year ended June 30, 1912. Likewise it will be noted that while in the fiscal year ended June 30, 1913, 29 cases of ringworm of scalp (tinea tonsurans) were certified, during last year only 17 were detected, this being a decrease of some 40 per cent, as compared to the previous year's record, and no favus was found. During the past two months but a single case of scalp disease has been detected. This points strongly to the fact that greater diligence is being used in detecting and preventing aliens suffering from loathsome scalp diseases from embarking than in preceding years.

There has been a decided increase also in the number of aliens detained in local institutions for observation, care, and treatment, 484 aliens were admitted, as compared to 456 for the previous year, as follows:

Presbyterian Eye and Ear Hospital	104
Hebrew Hospital	43
Sydenham Hospital	4
Mercy Hospital	1
Maryland Homeopathic Hospital	3
St. Joseph's Hospital	2
Johns Hopkins Hospital	1
Baltimore Quarantine Station	1
Immigrant Detention House	324

This increase is due in part to the number held for further mental observation.

There were 173 cases of acute communicable diseases held for treatment, as follows:

Measles	155
Chicken pox	6
Mumps	2
Scarlet fever	2
Diphtheria	2
Erysipelas	2
Smallpox	1
Cerebrospinal meningitis	1
Whooping cough	1

During the year there were 23 deaths from all causes. Twenty were caused by measles, a 13 per cent mortality; 1 from enteritis, 1 from nephritis, and 1 from cerebrospinal meningitis. At one period in December there were 82 ill aliens undergoing treatment or observation in the several local hospitals. These institutions decline to receive measles cases, and, as a result, the small hospital connected with the immigrant detention house was seriously overcrowded a number of times during the year.

An extension of the medical examination, to include a more thorough determination of the mental development of arriving aliens, instituted in May, has been carried on under considerable difficulty, and has greatly increased the work of the station.

Proper facilities for conducting these tests along the most efficient lines have not been provided for want of funds. The current year should see these wants supplied. For the proper prosecution of this work it should always be performed by two medical officers, when possible. The enforcement of these mental tests will result in the elimination of a number of undesirable aliens.

BOSTON, MASS.

During the past fiscal year the situation with respect to the immigration work of the service at Boston has completely changed. In addition to the steamship companies previously running passenger ships to Boston, four new lines have established a regular trans-Atlantic passenger service to this port, and still others have begun to send passenger ships here intermittently. The companies already in the field have increased the number and size of their passenger ships, and companies which formerly maintained a freight service only to Boston have begun to bring passengers as well. Thirteen steamship lines are now regularly bringing to Boston passengers whose medical examination prescribed by the immigration laws has to be provided for by the service.

A material increase in both the number of ships and passenger arrivals has taken place as compared with the previous fiscal year, but the new problems which have confronted the officers of the service have not resulted so much from the numerical increase in ships and passengers as from the change in character of the passenger travel to the port and the difficulty of maintaining, by reason of peculiar local methods of handling the passenger traffic of the port, a standard of efficiency in the medical examination comparable to that now being maintained under more favorable conditions at New York.

The immigration station at Boston is used only for offices and detention purposes. The primary examination of arriving passengers is never made there. The primary examination by the immigration officers as well as the medical inspection has to be made on shipboard or at the steamship docks. Nine widely separated docks about the harbor are now being used by regular steamship lines. Cabin passengers are invariably inspected on shipboard and to some extent this is necessary also in the case of steerage passengers. The passenger traffic at Boston is made up of a larger proportion of cabin passengers than at any other port. Many ships which have to be boarded by the medical officers bring only cabin passengers and in comparatively small numbers, but on other ships over 700 cabin passengers are not unusual. Four of the docks at which passenger ships land have provision for examining the steerage passengers ashore and a fifth is in process of construction. At this dock under construction it will be and at the Commonwealth Pier recently completed it is easily possible to handle more steerage passengers per hour and per day than could possibly be handled at Ellis Island. So far as mere inspection purposes are concerned the capacity of the Cunard pier at East Boston, now in use for several years, is about equal to the Ellis Island building in this respect.

The Immigration Service at Boston has regularly available for the purpose of making the manifest examination of arriving passengers 25 immigration inspectors, and this number could be somewhat increased in an emergency. In other words, the number of immigration inspectors at present available for the manifest examination of steerage passengers at Boston is fully equal to that usually employed on such duty at Ellis Island. Although the daily or weekly passenger arrivals at Boston have never reached the daily or weekly maximum for New York, and are never likely to, 3,500 passenger arrivals on different ships docking at widely separated points in a single day, and 5,000 arrivals within a period of three or four days, have been reached, and are likely at any time to be exceeded.

While the additional ships which have been placed in the Boston trade recently have increased the aggregate annual passenger arrivals, the tendency has been rather to concentrate passenger arrivals within the period of the year from March to November, the newer and larger ships being withdrawn for tourist cruises the remainder of the year. During these busier months the number of passenger arrivals varies greatly from week to week, but there is never a sufficient interval between the arrival of ships to enable the medical examination of the passengers of one ship to be completed before another arrives.

GALVESTON, TEX.

During the year ending June 30, 1914, 7,565 arriving aliens were examined at Galveston, including 1,401 cabin and 6,121 steerage passengers; in addition there were 9 stowaways and 34 members of crews wishing to be landed.

A total of 333 persons were admitted to the hospital, of whom 225 required treatment or observation to determine the diagnosis; among these aliens were 64 cases of measles, 1 case of varicella, 4 cases of whooping cough, 2 cases of erysipelas, 2 cases of mumps, 1 case of scarlet fever, and 1 case of cerebral meningitis.

Thirteen deaths occurred from the following causes among the patients just referred to: One death due to noma following measles; 3 deaths due to broncho-pneumonia following measles; 1 death from broncho-pneumonia; 1 death from broncho-pneumonia following entero-colitis; 3 deaths from entero-colitis; 1 death from pleuro-pneumonia; 1 death from cerebral meningitis; 1 death from marasmus; and 1 death from edema of lungs. It may be mentioned as a matter of melancholy interest that 8 of these deaths (all small children) occurred among the passengers from one vessel. with a passenger list of 805 aliens.

Four hundred and eighty-five certificates were issued during the year, distributed as follows:

Class.	Cabin.	Steerage.	Crew.	Stowaways.	Total.
Class A (I)		8	1		9
Class A (II)	3	40	2	1	46
Class B	43	329	1	1	374
Class C	6	48	2		56
Total	52	425	6	2	485

According to this table 429 certificates for class A and B diseases and defects were issued, indicating that among the 7,565 aliens arriving at Galveston 5.67 per cent were found to be afflicted with mandatory or other serious conditions. Forty-three persons (56 per cent) were afflicted with trachoma, and in a large percentage of these the condition was such that one had no difficulty in deciding that the disease could have been detected by a competent medical examination at the port of foreign embarkation.

The new immigrant station has been in use throughout the fiscal year, and the new arrangements provide facilities for doing the inspection work to very much better advantage.

HONOLULU, HAWAII.

During the year 5,210 aliens were examined on arrival, and 263 were certified for diseases or defects requiring certification under the immigration law. The arriving aliens consisted almost entirely of Japanese, Chinese, and Koreans, there being no Spanish or Portuguese among the arrivals as in the previous year. The number of arriving aliens presented for examination during the year was almost 50 per cent less than the number examined during the preceding year, but the percentage of medical certificates given for all causes during the year ending June 30, 1914, was a little in excess of the percentage given for all causes during the year ending June 30, 1913. There has been a perceptible decrease in the number of arriving Japanese aliens, as compared with the previous year. One hundred and sixty-seven class A certificates, 56 class B certificates, and 5 class C certificates were given for the Japanese arrivals; 25 class A certificates, 1 class B certificate, and 1 class C certificate were given for the Chinese arrivals. Eight class A certificates, only, were given for the Korean arrivals. The large number of certificates given for the Japanese, as compared with the other nationalities, is due to the excess of arriving Japanese over aliens of other nationality. There were 4,978 aliens examined for hookworm disease, and 63 were found to be afflicted with this disease. The largest percentage of rejections was due to trachoma, there being 135 certifications for this disease.

Twelve fines of $100 each were imposed during the year against steamship companies, under the provision of section 9 of the immigration law, for bringing in aliens found to be afflicted with dangerous contagious disease which might have been detected by competent medical examination at the time of foreign embarkation.

During the spring of the year a new laboratory, with connecting rooms for the examination of aliens, was constructed, which are cool and comfortable in the warmest weather and very conveniently arranged.

The efficiency of the hookworm examinations has been greatly augmented owing to the constant efforts made to improve the technique of preparing the microscopic specimens, and to the zeal and ability of the officer in immediate charge.

Hospital treatment of diseased aliens.—There has been a considerable increase during the year in the number of requests for the treatment of aliens found to be afflicted with disease upon arrival, viz: Ten Japanese and 7 Chinese were treated for trachoma, and 46 Japanese, 7 Chinese, and 5 Koreans were allowed treatment for uncinariasis. The number of days treatment furnished the trachoma cases averaged 66 days for each case, and an average of 22 days' treatment was furnished for each case of hookworm disease. The treatment of aliens afflicted with disease is now only undertaken upon the receipt of a written request signed by the inspector in charge.

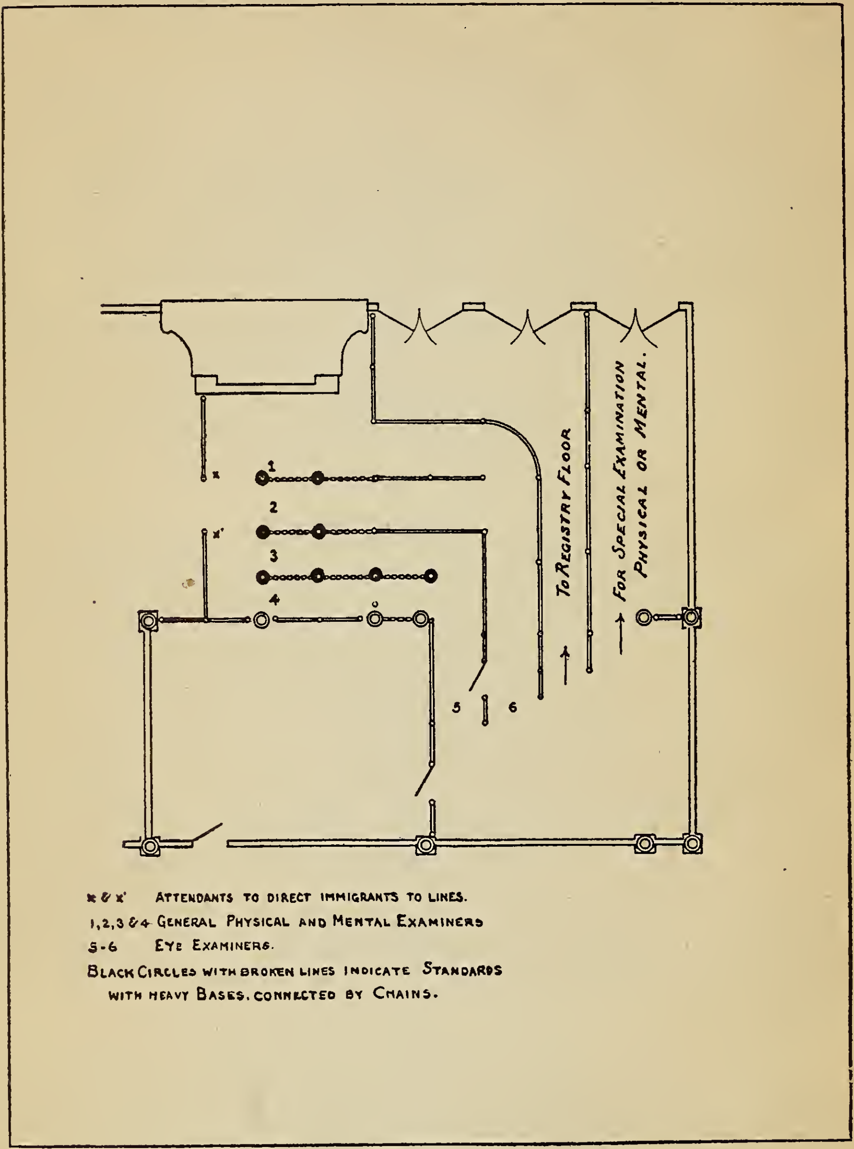
Examination of first-class passengers.—During the year several aliens traveling first class whose past history and social status was of such a nature as to create the suspicion in the minds of the immigration authorities that they were traveling first class in order to escape a close medical inspection. Upon examination these aliens were found to be afflicted with trachoma.

Examination of returning Chinese.—During the year 229 Chinese were examined for trachoma who were residents of Hawaii, and were desirous of paying a visit to their native country. Out of the above number of Chinese 20 were found to be afflicted with trachoma. The examination of resident Chinese prior to their departure for China, has been one of the peculiar features of the immigration work at this station. This practice was instituted as a special rule for resident Chinese who contemplated a visit to their native land, and were desirous of knowing whether or not they were afflicted with trachoma prior to departure. Notation of the results of these examinations were made upon the certificates issued to the Chinese by the immigration authorities just prior to sailing. These examinations were found to be a fertile cause of considerable embarrassment to the immigration authorities, inasmuch as all Chinese found to have trachoma prior to their departure, and who were afterwards detained upon their return to Hawaii because of the disease, contended that they should be released as it was proved that they had trachoma before leaving Hawaii for China. The rule has been annulled.

NEW YORK, N. Y.

The work at this station has proceeded during the year along the general lines indicated in previous reports, but certain developments are worthy of note. On account of the increasing attention devoted to the subject and the gain in experience on the part of the medical staff the number of the mentally defective certified during the fiscal year has shown a notable increase. During the fiscal year 1912, 19.6 defectives (including idiots, imbeciles, and feeble-minded) per 100,000 immigrants were certified. In 1913 the number increased to 50.8 per 100,000. During the past year 96 defectives per 100,000 were certified, or an increase of 88.9 per cent over the results of 1913, and an increase of 389 per cent as compared with the year 1912.

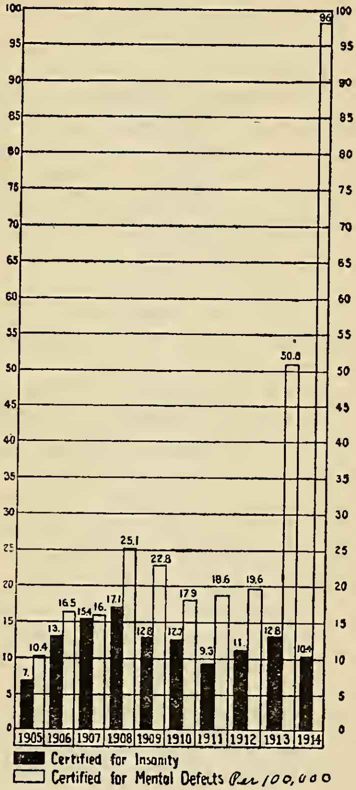
In connection with this work a medical officer is now engaged in the mental examination of a large number of normal immigrants of various races and nationalities, with a view to obtaining data which will be of value in improving the methods of examination of defectives now in use, and throwing light upon the relative worth of the diagnostic measures now employed. This inquiry has been under-


x
x'
1
2
3
4
5
6
To Registry Floor
For Special Examination
Physical or Mental.
x & x' Attendants to direct immigrants to lines.
1,2,3 & 4 General Physical and Mental Examiners
5-6 Eye Examiners.
Black Circles with broken lines indicate Standards
with heavy Bases. connected by Chains.

Floor Plan for Medical Examination of Immigrants.

taken in connection with the work of a board of medical officers of this station detailed by the Surgeon General for the purpose of preparing a manual of mental examinations.

Certain physical changes in the facilities for the line inspection have resulted in an increase of efficiency. Heretofore two medical officers have been stationed on each inspection line, and it has been the especial duty of one of these officers to turn eyelids and inspect the eyes. It has been found that he can work approximately twice as fast as his colleague, who makes a general inspection and interrogates each immigrant. By a change in the line, as indicated in the diagram, four lines are now operated instead of three, without increasing the number of officers engaged, a single officer being able to examine eyes for two lines.



A medical officer and an interne have recently been assigned to exclusive duty in the station laboratory for the purpose of making necessary diagnostic examinations in aid of the line inspection and to afford diagnostic and therapeutic aid to the two immigrant hospitals. Apart from organization, arranging apparatus, preparing material, etc., the work done to date includes Noguchi reactions, the making of autogenous vaccines, blood cultures and diagnostic inoculation of animals, besides the routine work of a busy clinical laboratory. Later it is expected that original research work will be undertaken in connection with the wealth of material obtainable.

A study has been undertaken and is now in progress to determine, if practicable, the presence of carriers of cerebrospinal meningitis in the detention rooms, a number of cases having recently occurred. Such determination is especially difficult, however, on account of the constant change of inmates of those rooms.

With the active cooperation of the Acting Commissioner of Immigration the daily taking of the temperature of all children under 10 years old was begun in the detention rooms during the year, in order to aid in the early detection of cases of acute infectious disease and their prompt isolation in hospital. From November 15, 1913 to January 30, 1914, 212 cases of febrile disease of undetermined character were removed from the detention rooms; 121 proved to be noncontagious diseases of various kinds; 81 proved to be infectious diseases. It is reasonable to believe that the early removal of these patients materially reduced the chances of transmission to other inmates of the detention rooms. Most of these cases developed within the period of incubation as reckoned from the date of arrival, and were therefore infected on shipboard. The large number of such cases found among the detained points to a still larger number which would occur among the 87 per cent of aliens who pass through the station without detention, and indicates the need of more stringent isolation of the early cases which occur on board ship.

Later in the fiscal year a woman acting assistant surgeon was appointed and assigned to duty in the women's examination room. For obvious reasons this measure has resulted in rendering practicable a more critical inspection of women immigrants turned aside for further medical examination, and is regarded as making for increased efficiency. The employment of two women physicians for this work is necessary.

The repairs recently completed in the Immigration General Hospital has materially contributed to the convenience of administration and the better utilization of the available space.

The repairs now in progress in the Contagious Disease Hospital (interior and exterior painting of buildings and glazing of corridors) will add much to the appearance of the hospital and the comfort of the inmates. Additional small rooms for special cases are needed in the Contagious Disease Hospital and the alteration of one of the large wards for this purpose has been recommended.

During the year passengers arrived at New York from foreign ports as follows:

Aliens in cabin	220, 198
Aliens in steerage	789, 656
Total aliens	1, 009, 854
Citizens (cabin)	144, 046
Citizens (steerage)	23, 059
Total citizens	167, 105
Grand total (aliens and citizens)	1, 176, 959

MEDICAL CERTIFICATES.

Class A (I), including 5 idiots, 64 imbeciles, 890 feeble-minded, 9 epileptics, and 110 insane. Twenty-two aliens certified for tuberculosis	1, 100
Class A (II) (dangerous, contagious, and loathsome contagious diseases)	19, 616
Class C (disease or defects of less degree)	953

Disposition of immigrants certified.

Class A (I):

Cases pending at beginning of year	38
Cases certified during year	1, 100
Total to be accounted for	1, 138
Cases deported	1, 078
Cases landed	43
Cases pending at close of year	17

Class A (II):

Cases pending at beginning of year	47
Cases certified during year	1, 547
Total to be accounted for	1, 594
Cases deported	1, 496
Cases landed	45
Cases pending at close of year	53

Class B:

Cases pending at beginning of year	282
Cases certified during year	19, 616
Total to be accounted for	19, 898
Cases deported	6, 236
Cases landed	13, 519
Cases pending at close of year	143

Class C:

Cases pending at beginning of year	8
Cases certified during year	953
Total to be accounted for	961
Cases deported	48
Cases landed	912
Cases pending at close of year	1

HOSPITAL CASES.

In the two immigrant hospitals there were treated during the year 10,485 cases.

Immigrant hospital (general):

Remaining at beginning of year	178
Admitted during year, including 19 born in hospital	8, 933
Total to be accounted for	9, 111
Discharged	8, 876
Died	86
Remaining at close of year	149

Immigrant hospital (contagious diseases):

Remaining at beginning of year	128
Admitted during year	1, 246
Total to be accounted for	1, 374
Discharged	1, 246
Died	98
Remaining at close of year	30

Admissions for "observation fever" to Immigrant Hospital from the main building for the period extending from Nov. 16, 1913, to June 30, 1914.

Admissions.	Days in main building.	Infectious.	Diagnosis.
87	1 to 5	27	Measles, 20; scarlet fever, 5; diphtheria, 2.
68	5 to 10	18	Measles, 12; scarlet fever, 5; cerebrospinal meningitis, 1.
34	10 to 15	12	Measles, 9; scarlet fever, 2; whooping cough, 1.
13	15 to 20	12	Measles, 12.
8	20 or more	10	Measles, 8; chicken pox, 2.
2	Warrant cases not ascertained.	2	Measles, 2.
212		81	

Upon the request of the Commissioner of Immigration medical officers visited 112 aliens who had become public charges or inmates of various institutions in New York and the vicinity and examined them to determine the nature of the disease or defect, and to ascertain whether due to causes existing prior to landing.

Summary of hospital transactions at Ellis Island.

Number of patients in hospital at beginning of year	306
Patients admitted to hospital during year	10, 179
Total treated (men 5,439, women 2,339, male children 1,449, female children 1,258	10, 485
Births (male 9, female 10)	19
Deaths (men 36, women 21, male children 69, female children 58)	184
Pay patients treated during the year	9, 855
Free patients treated during the year	630
Days treatment for pay patients	85, 488
Days treatment for free patients	4, 898
Total days treatment for hospital cases	90, 386

Maximum number of patients in hospital at any one time during the year	355
Daily average number of patients in hospital	247
Patients in hospital at end of year	179

Immigrant Hospital:

From previous year	306
Admitted during the year	10,179
Total treated	10,485
Recovered	5,591
Improved	1,737
Not improved	2,794
Died	184
Remaining end of year	179
Days treatment	90,386

Nativity and race of immigrants certified for trachoma during the fiscal year ended June 30, 1914.

Nativity.	Cuban.	African, black.	Armenian.	Bulgarian.	Croatian.	Chinese.	Finnish.	Flemish and Dutch.	French.	German.	Greek.	Hebrew.	English.	East Indian.	Irish.	Italy, southern.	Italy, northern.	Lithuanian.	Magyar.	Persian.	Polish.	Roumanian.	Russian.	Ruthenian.	Scotch.	Slovak.	Spanish.	Syrian.	Servian.	Scandinavian.	Turkish.	Total.
Austria-Hungary					31					8		20							26		25	14		24		23			2			173
Belgium								3																								3
British West Indies		4																														4
China						17																										17
Cuba	3																															3
East India														1																		1
France									2			1																				3
Germany										7		1									2											10
Greece											56																					56
Holland								1																								1
Italy																314	7															321
Persia																				3												3
Russia			8				7			29		95						59			157		22									377
Roumania												5																				5
Spain																											47					47
Sweden																														1		1
Turkey			42	3							2	6																119			9	181
United Kingdom													3		4										1							8
Total	3	4	50	3	31	17	7	4	2	44	58	128	3	1	4	314	7	59	26	3	184	14	22	24	1	23	47	119	2	1	9	1,214

Summary of clerical work incident to the medical inspection of immigrants.

Permits and admission record cards sent to hospital and filed in office upon admission of patients	40, 716
Notices to steamship companies upon admission of patients	3, 022
Certificates rendered of arriving aliens	23, 216
Certificates rendered of public charge cases	156
Certificates rendered of infancy cases	511
Receipts on hand for money and valuables, $3,343; watches, 29; pieces of jewelry, 53	118
Receipts given patients for money and valuables held for safekeeping in amount, $223,162.09; watches, 1,759; pieces of jewelry, 3,266	6, 418
Receipts canceled in money and valuables returned to patients in amount, $225,262.09; watches, 17; pieces of jewelry, 3,281	6, 336
Receipts for money and valuables still on hand, in amount, $2,243; watches, 21; pieces of jewelry, 38	82
Daily report of hospital transactions rendered to the Commissioner of Immigration and chiefs of divisions	2, 190
Reports of immigrants placed in hospital rendered to chief of registry division	1, 184
Ship surgeon's report of diseases and injuries occurring among immigrants during the voyage received and filed	1, 184
Vouchers received and forwarded for payment	1, 068
Checks received and forwarded	2, 151
Letters and telegrams received	2, 240
Letters and telegrams sent	3, 248

Receipts on hand for money and valuables, $3,343.

Nativity and sex of immigrants admitted to hospital during fiscal year ended June 30, 1914.

Nativity.	Men.	Women.	Children.		Total.
			Male.	Female.	
Austria-Hungary	1,073	579	346	325	2,323
Belgium	13	3	6	8	30
Brazil	2	1	1		4
Bulgaria	32	2	3	1	38
Canada	6	2	2		10
Cuba	3	4	2	9	18
China	38				38
Chile	4				4
Denmark	11	7	3	3	24
Egypt	1			1	2
France	30	11	7	10	58
Germany	99	55	39	27	220
Greece	418	64	32	26	540
Holland	17	15	12	11	55
Italy	1,529	524	322	243	2,618
India	21				21
Japan	1				1
Montenegro	12				12
Mexico		1		3	4
Norway	31	11	5	5	52
Persia	2				2
Peru		1			1
Portugal	10	1	1		12
Roumania	19	12	9	8	48
Russia	1,060	686	471	412	2,629
Spain	104	13	5	3	125
Sweden	41	17	6	3	67
Switzerland	9	7	2	1	19
Servia	4	2			6
Turkey in Asia	259	80	47	32	418
Turkey in Europe	268	43	26	15	352
United Kingdom	210	123	28	27	388
United States	3	1	5	10	19
Not specified	6	5	3	7	21
Total	5,336	2,270	1,383	1,190	10,179

Race and sex of immigrants admitted to hospital during fiscal year ending June 30, 1914.

Race.	Men.	Women.	Children.		Total.
			Male.	Female.	
African, black	29	22	3	1	55
Albanian	37	3	4	1	45
Armenian	139	29	13	11	192
Bohemian	16	10	4	5	35
Bulgarian	46	2	4	1	53
Croatian	131	42	38	36	247
Cuban	....	4	2	9	15
Chinese	24	....	....	....	24
Dalmatian	19	2	3	2	26
Dutch and Flemish	25	18	17	19	79
East Indian	20	....	....	....	20
English	82	38	12	11	143
Finish	20	13	4	2	39
French	25	10	6	8	49
German	234	152	98	97	581
Greek	461	68	28	25	582
Hebrew	565	353	249	219	1,386
Irish	75	48	2	7	132
Italian, southern	1,434	499	306	225	2,464
Italian, northern	96	25	18	22	161
Lithuanian	84	86	51	36	257
Magyar	129	90	72	78	369
Mexican	....	....	....	2	2
Montenegrin	10	....	....	....	10
Polish	492	362	232	178	1,264
Portuguese	11	2	1	....	14
Roumanian	101	18	18	14	151
Russian	137	32	27	27	223
Ruthenian	184	99	43	38	364
Scandinavian	90	37	14	12	153
Scotch	21	15	2	6	44
Servian	30	8	1	3	42
Slovak	109	74	45	45	273
South American	3	1	....	....	4
Spanish	100	13	6	6	125
Syrian	189	64	39	26	318
Turkish	50	....	....	....	50
American	1	....	1	2	4
Welsh	4	2	4	1	11
Not specified	111	29	16	15	171
Canadian	2	....	....	....	2
Total	5,336	2,270	1,383	1,190	10,179

Race of immigrants deported on medical certificates during fiscal year ended June 30, 1914.

Races.	Men.	Women.	Children.		Total.
			Male.	Female.	
Abyssinian			1		1
African, black	13	6			19
Albanian	35		2	2	39
Armenian	107	9	1		117
Bohemian	10	2			12
Bulgarian	56	3			59
Chinese	16				16
Croatian	198	19	4		221
Cuban	2			1	3
Dalmatian	13	2			15
Dutch and Flemish	15	2			17
East Indian	5				5
Egyptian	1				1
English	39	8	1		48
Finnish	13	4			17
French	16	1			17
German	242	28	1	4	275
Greek	975	27			1,002
Hebrew	818	165	18	8	1,009
Irish	53	27		1	81
Italian, southern	2,690	344	17	19	3,070
Italian, northern	53	9			62
Lithuanian	60	51		1	112
Macedonian	26				26
Magyar	306	22	1	1	330
Maltese	1	1			2
Montenegrin	11	2			13
Persian	3				3
Polish	654	172	3	2	831
Portuguese	22	2			24
Roumanian	290	15			305
Russian	166	19			185
Ruthenian	245	59		1	305
Scandinavian	28	7	1	1	37
Scotch	3	6			9
Servian	37	6			43
Slovak	165	27	1	2	195
Spanish	95	7	2		104
Syrian	168	30	1	2	201
Turkish	26	1			27
Total	7,676	1,083	54	45	8,858

PHILIPPINE ISLANDS.

The medical inspection of immigrants who desire to enter the Philippines is of special value because many of the diseases that are excluded have not yet gained a foothold. For instance, trachoma among Filipinos of the type that causes blindness is almost unknown. On the other hand, there is reason to believe that if Filipinos were exposed to the severer types of the disease that prevail among other races they would also contract that type and suffer the same disastrous effects.

This is the second year in the Philippines during which uncinariasis was classified as an excludable disease. There were in all 6,776 examinations made for hookworm of aliens and steerage passengers; of these, 198 resulted positively. Three aliens with hookworm were treated, one of whom was negative to subsequent tests, and two were certified and deported.

The percentage of hookworm infection by nationality was as follows:

Nationality.	Number examined.	Number positive.	Percentage with hookworm.
Chinese	4,795	116	2.42
Japanese	898	7	.78
East Indians	212	18	8.49
Malays	850	57	6.70
All others	10		

The certifications during the year were for the following causes:

Hookworm	3
Trachoma	81
Favus	2
Ringworm of scalp	2
Insanity	1

The largest percentage of rejections is still due to trachoma, the number from this cause during the year being 81, or 91 per cent of the total rejections, with 64 deportations. The percentage of rejections for all causes was 2.4 per cent, of which 64, or 1.8 per cent of the total arrivals, were deported. This percentage of rejections and deportations is believed to be a higher percentage of rejections and deportations than obtains at the several ports of continental United States.

The arriving aliens were principally Chinese, Japanese, and East Indians. By race, the East Indians continued to show the largest percentage of rejections, and as heretofore they were almost all due to trachoma.

The number of arrivals by port were as follows: At Manila, 3,056; Iloilo, 327; Cebu, 103; Jolo, 102; Zamboanga, 104.

The rejections, by nationalities, were as follows: Chinese, 4; Japanese, 35; East Indians, 21; Spanish, 5; French, 1.

At the immigrant medical inspection made at the various ports of the islands the arriving aliens were classed as follows:

Chinese	1,751
Dutch and Flemish	11
East Indian	167
English	150
French	50
German	90
Irish	23
Italian	10
Japanese	1,083
Portuguese	15
Russian	15
Scandinavian	4
Scotch	28
Spanish	244
Syrian	10
Turkish	13
All other people	28
Total	3,692

FILIPINO EMIGRATION.

The emigration of Filipinos to Hawaii does not come under the immigration laws of the United States, but it may be of interest to report that owing to objections made by the health authorities of the Territory of Hawaii against diseased Filipinos being permitted to enter Hawaii, a medical-inspection service was organized by the Hawaiian Sugar Planters' Association, the physicians of which make an examination of all Filipinos who apply for positions in Hawaii. The object of the examination is to eliminate all those who are afflicted with dangerous communicable diseases or who are physically unfit. By special request of the Hawaiian Sugar Planters' Association, the medical inspection is made by physicians recommended by the bureau of health for the Philippine Islands. The inspections made are of great value to the service in providing an additional check against quarantinable disease being transmitted on vessels bound from the Philippines to Honolulu.

PHILADELPHIA, PA.

The Philadelphia Immigration Station is located at Gloucester City, N. J., some 4 miles below Camden, and may be reached by boat from Philadelphia and from Camden by train or trolley.

The general appearance of the station is good, but the buildings are barely sufficient for the present station business, so that others will be necessary before primary inspections can be made there and before more satisfactory methods of handling the medical end of the work can be attempted.

The Immigration Service force consists of the following: A commissioner, an assistant commissioner, 13 inspectors, 6 interpreters, 6 clerks, 4 matrons, 6 watchmen, laborers, and others not regularly employed.

The Public Health Service force consists of two medical officers and two female attendants (acting nurses).

During the fiscal year ending June 30, 1914, 63,837 passengers arrived at the port of Philadelphia; 60,483 of these were aliens, of whom 2,099 received medical certificates; and 256, being found on arrival to need medical care, were sent to Philadelphia hospitals. Forty-four cases certified as having loathsome or dangerous contagious diseases were landed for treatment.

The larger vessels coming to Philadelphia are usually boarded near Marcus Hook by one of the medical officers, who examines the cabin passengers as they proceed up the river.

Ships of the American and Hamburg-American Lines go to Pier 53, at the foot of Washington Avenue, while those of the North German Lloyd and Italian lines go to Pier 19, at the foot of Vine Street. At these piers the steerage passengers are examined. Portions of the second floors of the pier buildings are arranged somewhat similarly to the registry floor at Ellis Island, the primary medical examination being conducted at one end and those passed moving on to the inspectors at their desks.

When vessels come via New York, as is usually the case with those of the Italian lines, it is customary for a party, including a medical officer, to proceed to New York and complete the primary inspection of both cabin and steerage passengers while en route to Philadelphia. This happens about twice a month.

Aliens for further medical observation, along with those held for various other reasons, are sent to the station at Gloucester City for detention. The total number detained during the year was 6,179, with a daily average on hand of about 105, and of these 875 required medical attention for complaints ranging from toothache to attempted suicide.

Diseases and injuries treated at immigration detention house, Gloucester City, N. J., for fiscal year 1914.

Abortion	2
Abscess	9
Amemorrhea	1
Barber's itch	1
Boils	12
Bronchitis	16
Burns	13
Childbirth	3
Colic	25
Congestion of liver	1
Conjunctivitis	33
Constipation	176
Contusions	5
Coryza	4
Diarrhea	5
Dislocated finger	1
Dysmenorrhea	1
Earache	8
Eczema	5
Effects of childbirth	2
Erysipelas	4
Febricula	4
German measles	2
Headache	143
Hernia	1
Hysteria	34
Impetigo	14
Indigestion	15
Infected wounds	38
Inflammation lymph glands	3
Inflammation middle ear	2
Ivy poison	1
Malaria	2
Measles	25
Mumps	1
Neuralgia	2
Pneumonia	3
Prickly heat	2
Quinsy	1
Pulmonary tuberculosis	2
Removal sebaceous cyst	1
Rheumatism	10
Ringworm of body	1
Scabies	7
Sprains	6
Starvation	2
Strangulation	1
Syncope	3
Tonsilitis	49
Toothache	60
Ulcerated mouth	1
Ulcer skin of leg	1
Ulcer of stomach	1
Urticaria	2
Vaccination	107
Whooping cough	1
Total	875
Treatments	1,300

SAN FRANCISCO, CAL.

During the fiscal year ending June 30, 1914, 16,924 immigrants, or an increase of a little over 4,000 more than the preceding year, were inspected by the medical officers of this station.

Of this number, 6,266 were brought from the vessels on which they arrived to Angel Island for more extended investigation. All of the other passengers were not necessarily released on primary examination by the medical officers, for the reason that at this station several classes of arriving orientals are admitted without medical inspection.

The rather unusual percentage brought to the hospital is accounted for by the fact that experience has demonstrated that it is quite impossible to say with any degree of accuracy whether or not an oriental has hookworm disease until a microscopical examination has been made to determine the presence or absence of the ankylostoma, or necator, in the feces. The medical officers of the station so fully appreciate the impossibility of accurate decision without the microscope that on primary examination aboard ship their attitude is not to say to themselves, "I am sure from his appearance that this alien has hookworm disease, therefore he must be taken to the hospital for further examination," but rather, "I am not sure that this alien has not hookworm disease, therefore he must not be released until I can determine positively that he is not infected." This attitude is assumed in relation to second-class and steerage passengers, and has been amply justified by the results obtained, but it is not adopted at present in relation to first-class passengers because of department telegram of March 4, 1914, reading: "Until receipt of further orders fixing definite policy to be pursued in hookworm cases of all kinds, allow first-class passengers to land without detention for delayed examination for said disease, unless its existence is indicated by ship's record."

Of the total number of aliens inspected during the year, 1893, approximately the same number as last year, were certified as presenting one or more of the various conditions of which notice must be taken under the immigration law.

The fact that notwithstanding some 4,000 more aliens arrived this year than last, and only the same number, approximately, were certified, is attributable to the different systems employed now than formerly in regard to hookworm-infected passengers. Up to January 1, 1913 (which includes one-half of the fiscal year 1913), no attention was paid to infection by this disease at the port of embarkation, and the result was the landing at this port of an extremely high percentage of infected aliens; so high, in fact, as to tax the resources of this hospital beyond its physical capabilities. With a view to limiting the number of cases thus arriving, the Immigration Service (as stated in the 1913 report of the transactions of this station) inaugurated the system of demanding from each arriving alien a certificate that, prior to embarkation, he had been examined for, and found free from, hookworm disease. This procedure resulted, especially in the case of Japanese, in markedly reducing the number of infected arrivals, and is still used, as far as Japanese are concerned; but for some reason the results obtained in the cases of Chinese were not so satisfactory—in fact, on some vessels the percentage of infection was very little different from that obtained before the inauguration of the system.

This failure led the Pacific Mail Steamship Co. to inaugurate the system of treating hookworm-infected passengers aboard ship, with the result that a very much smaller percentage of aliens are now landed here infected. A certain proportion of the Chinese brought by the Pacific Mail Steamship Co. have certificates of examination prior to embarkation and showing negative results. These cases are examined in the same way as all others by the medical officers of this station, for the reason that the chief medical officer's attitude is that, as the Public Health Service is responsible for their admission into the country, he should not accept as final, and without verification, the certificate of any other than an officer of the Public Health Service. No fine, however, is imposed upon the steamship companies in cases found to be infected, if they hold a negative certificate of examination by any medical man of recognized standing, as it is admitted that in a certain small percentage of cases a mild infection might, though present, be overlooked, and the examination still be "competent" within the meaning of the regulations.

In the other class of cases—namely, those receiving treatment on board—the situation assumes an entirely different aspect, for the reason that treatment would not be given unless known infection exists. That being the case, and section 9 of the immigration law definitely prescribing the imposing of a fine of $100 against the steamship company bringing in a dangerous contagious disease "which might have been detected at the port of embarkation by means of a compentent medical examination," no course is open to the chief medical officer, provided the aliens are still infected upon landing at this port, other than to advise the Commissioner of Immigration of that fact, with a section 9 (fine) certificate attached.

A considerably larger percentage of aliens were certified this year as being afflicted with trachoma than were so certified during 1913. The disease, however, has been of the extreme type in only a few cases, and it has been possible to effect a cure in all cases that were granted hospital treatment by the department; namely, 39 per cent of those certified. The attitude of the medical division toward imposing a fine under section 9 of the immigration law in cases of trachoma landed at this port has been the same as last year; namely, that in those cases in which it was necessary to hold the alien under observation any considerable length of time to establish a diagnosis beyond question no fine should be imposed, because there might be ground for an honest difference of opinion. In those cases, however, in which the diagnosis is, or should be, apparent on the first examination, fines have been imposed.

More cases of insanity and feeble-mindedness have been certified this year than last, but the chief medical officer does not feel at all sure that all casses coming under this head that have presented themselves for examination have been detected, and a moment's thought given to the difficulties of always establishing such a diagnosis in occidentals, plus the very much increased difficulties experienced when an oriental is the one to be dealt with, will explain the reason for the feeling expressed.

SEATTLE, WASH.

The total number of immigrants examined exceeded the previous year by about 500, being for this year 4,090. Certificates were issued to the number of 237, or about 5.7 per cent of the total. Hookworm cases made up 201 of this number, this being 175 less than last year, due probably to more stringent selection at the foreign port, it being observed that a better class of women are coming than formerly. One explanation of better selection is the fact that the Japanese men are going in person to the fatherland to select their wives, whereas, the universal custom in the past has been to marry by proxy through the medium of photographs. Trachoma gives a total of 23 for this year, an excess of 17 over last year, these mostly among Chinese of the returning laboring class. Other diseases of a serious nature are conspicuous by their absence, a notable example being mental diseases. The Japanese and Chinese supply very few of these cases to our institutions, as so far apparently their lives are simple and therefore nervous diseases rare.

The following is a table of hookworm cases, which is self-explanatory:

Japanese.

Age period.	Examined.	Infected.	Per cent.
Females.			
0 to 14	10	5	50.0
15 to 30	192	94	48.9
31 to 50	56	31	55.3
Total	258	130	50.3
Males.			
0 to 14	22	9	40.9
15 to 30	61	36	59.0
31 to 50	1	1	100.0
51 and over	1		
Total	85	46	54.1

Hindus.

15 to 30	10	8	80.0
31 to 50	2	2	100.0
Total	12	10	83.3

Chinese.

0 to 14	6	3	50.0
15 to 30	37	12	32.4
Total	43	15	34.6

Treatment for these cases is allowed and takes place in the detention house. An average of 25.2 days is required to effect a cure, and so far all have yielded to treatment. It has required an average cost of $33.84 for each case treated, this including cost of medical services and subsistence.

DOMESTIC (INTERSTATE) QUARANTINE.

The work of this division has continued to increase and expand during the past year. Plague-preventive measures in San Francisco and near-by cities, and in Seattle, Wash., have been continued. Plague-suppressive measures were continued in Porto Rico until October 1, 1913, when this work was discontinued. Rocky Mountain spotted fever, a disease widely distributed throughout the Western States, and which exists in virulent form in the Bitter Root Valley, Mont., has been reduced through measures instituted by an officer of the service. Work has been carried on for improving the sanitary conditions in Alaska and the prevention of the spread of communicable diseases in that Territory. The inspection of public buildings, in accordance with Executive Order No. 1498, has been continued, and many changes have been made toward creating better sanitary conditions in these buildings. The interstate quarantine regulations, and amendments thereto, are being enforced, and as a result the sanitary condition on common carriers is undergoing improvement. Many lectures have been given by officers of the service on questions of sanitation and hygiene, at the request of local health authorities. Assistance has been rendered to authorities of the Panama-Pacific International Exposition in caring for sick and injured employees and advising relative to the sanitation of the exposition grounds and buildings. An extensive exhibit for the service is under preparation for the Panama-Pacific International Exposition, and an officer of the service is acting as superintendent of the sanitary exhibits for the exposition.

PLAGUE-SUPPRESSIVE MEASURES.

OPERATIONS IN SAN FRANCISCO, CAL.

The operations in San Francisco, Cal., have been conducted under the supervision of Surg. J. D. Long, and may be classified under the following headings:

1. Measures for the destruction of rats. (*a*) Trapping; (*b*) poisoning.
2. Measures for the abolition of rat food.
3. Measures for the destruction of rat harbors and for the permanent rat-proofing of buildings.
4. Measures taken to free shipping of rats, cooperating with the chief quarantine officer of the port.
5. Miscellaneous work of the division.

MEASURES FOR THE DESTRUCTION OF RATS.

Trapping.—An average of 9,797 traps, snap and cage, have been in use daily, scattered throughout the city. These were placed, baited, and inspected regularly by a force of Federal employees. All rats caught were tagged, giving exact location where caught, and the date; segregated according to species, counted, and these facts recorded in a journal. They were then sent to the Federal laboratory for post-mortem examination of each rat. By these means not only is the rat increase kept down, but, what is more important, surveillance is kept over the rat population, and should reinfection with plague occur among them, it would be found out promptly, and steps could be taken immediately to stamp out the infection.

During the fiscal year 1914, 63,456 rats were trapped, not including 11,671 mice trapped, which is an unavoidable incident in the taking of rats. No rats were reported plague infected or suspicious of plague during the year.

By the use of pins with varicolored heads, stuck into maps of the city on the walls of the central office, the rat catch is kept track of and shown in graphic manner. These maps are of great value as they show at a glance where the rats are congregating, and indicate where other measures than trapping should be put into effect to break up their harbors.

The following tabulated statement shows the number and character of premises trapped, number and kind of traps used, and the resultant catch:

Character of premises.	Premises.	Cage traps.	Snap traps.	Rats trapped.	Rats per 100 traps per day.
Stores	851	18	3,065	16,867	1.79
Sewers	340	327	54	7,516	6.46
Restaurants	189	7	779	5,506	2.29
Stables	160	16	556	5,086	2.91
Dwellings	928	14	2,393	11,977	1.63
Factories	108	8	476	3,720	2.52
Vacant lots	47	3	166	1,799	3.49
Bakeries	16	....	64	444	2.27
Warehouses	147	6	660	4,171	2.07
Water front	....	11	477	1,545	1.03
Butchertown	43	4	226	2,622	3.83
Steamers[1]	220	9	458	2,203	1.54
Total	3,049	423	9,374	63,456	2.64

[1] Steamers trapped on 1,580 times.

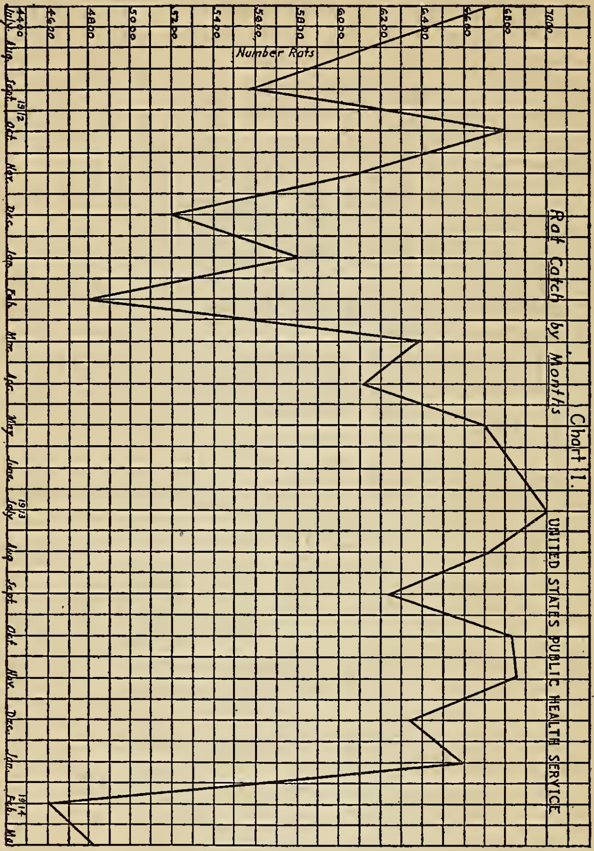
The curve in chart 1, on page 226, shows in a graphic manner the rat catch by months for the last two fiscal years.

The fall which took place in November and December of 1912 followed intensive poisoning of the city sewer system. The even more marked fall which took place in February, 1914, followed a recommencement of general poisoning of premises throughout the city, which had been discontinued for several years, owing to the danger of poisoning children, animals, and fowls, and, if phosphorous poison be used, the danger from fire.

An improved formula and type of arsenic poison has been developed which, by the addition of a quantity of black analine, giving it a slate gray color, renders it much less likely to be picked up by children.

The phosphorous poison, which is spread on slices of bread, and the slices then cut up into small cubes, is still used in the sewers, where the fact that it is somewhat luminous is an advantage.

Golden Gate Park became badly rat infested on account of the active antirat measures carried out in the city of San Francisco. The service squirrel destructor was used to rid the park of rats, with marked success.



The following tables summarize the operations for the destruction of rats during the last year and the comparative catch of the various varieties from 1909 to 1914, inclusive, is also shown:

Measures for the destruction of rats.

Rats trapped		63,456
Rats found dead		657
Mice trapped		11,671
Squirrels trapped		9
Gophers trapped		4
Bait used:		
Bacon	pounds	4,365
Bread	loaves	4,439
Poisons placed		2,454,078
Bread used for poison	loaves	13,871
Arsenic paste	pounds	1,472
Phosphorous poison	do	2,554

NOTE.—The number of mice is an unavoidable incident in the trapping of rats.

Comparative catch of various species of rats.

Species.	1909	1910	1911	1912	1913	1914
Norvegicus	78,630	72,613	58,856	46,597	51,140	46,600
Rattus and alexandrinus	4,162	10,509	13,429	21,525	19,190	16,856
Total	82,792	83,122	72,285	68,122	70,330	63,456

NOTE.—Since Mus rattus and Mus alexandrinus are practically always trapped in the same localities, and in equal numbers, the catch is consolidated.

By city ordinance all garbage cans offered for sale must be approved by the board of health. During the year more than 13,000 new sanitary garbage cans were installed by householders on their own initiative. These cans have tight-fitting metal covers and are frequently inspected to insure the retirement from service of battered and leaking cans. A proper can prevents garbage becoming rat food or creating a sanitary nuisance, and the citizens of San Francisco have become educated to the importance of the use of such cans.

Measures taken for the destruction of rat food.

Premises inspected	74, 272
Nuisances abated	16, 346
Complaints investigated	3, 969
Garbage cans installed	3, 896
Chicken yards abandoned	603
Chicken houses concreted	153
Area (square feet)	14, 094
Chickens, pigeons, rabbits, etc., disposed of	12, 077
Premises screened	45
Toilets screened	41
Notices served	7, 378
Plumbing complaints referred to board of health	206
Vacant lots cleaned	457
Basements cleaned	915
Yards cleaned	1, 511
Premises cleaned of rubbish	1, 204
Plumbing nuisances abated	153
Lots from which stagnant water has been pumped	40
Garbage cans inspected and stamped	17, 559

Measures taken for the destruction of rat harbors.

Floors torn up	708
Basements torn up	502
Yards torn up	406
Passageways torn up	237
Sidewalks torn up	67
Buildings destroyed	703
Premises in which wood was piled off the ground	187
Stables destroyed	123
Stables concreted	119
Area (square feet)	227, 605
Stables cleaned	251
Manure bins installed	181
Feed bins installed	145

MEASURES FOR THE PERMANENT RAT-PROOFING OF BUILDINGS.

Erection of rat-proof buildings only.—By city ordinance only rat-proof new construction is now permitted in San Francisco. In brief, the provisions and requirements are that the foundation walls shall be of concrete or brick and the ground area inclosed by such walls to be covered by a layer of concrete not less than 1½ inches in thickness. If the basement area is to be used for any purpose, the abovementioned concrete floor must be 3 inches thick and covered by a wearing surface of cement not less than one-half inch in thickness.

Measures for the permanent rat-proofing of new buildings.

New buildings rat-proofed		2,324
Basements concreted (1,818)	square feet	2,304,692
Floors concreted (777)	do	2,268,758
Yards concreted (411)	do	172,305
Passageways concreted (1,245)	do	184,237
Sidewalks concreted (1,091)	do	484,314
Total laid in new premises		5,414,306

The problem of rat-proofing class A, B, and C buildings.—These buildings all have foundations, walls, and basements constructed of hard material, and are the only type allowed constructed within the fire limits, which comprise the main business, wholesale, hotel, and part of the apartment-house sections of the city. However, due to the negligence or carelessness of plumbers and wiremen, openings made in the walls for the passage of sewer and water pipes, and for the conduits containing light, power, and telephone wires will be left unsealed, affording in many cases portals of entry and exit for rats alongside of the pipes and wires traversing the walls.

In the annual report of this division for 1912 and 1913 considerable attention was given to the discovery of the steady and marked increase in the roof rats (M. rattus and M. alexandrinus) and apparent causes for such increase were discussed at length, this increase being mainly confined to the down-town business and wholesale produce section of San Francisco.

To understand what will follow it seems important that the summary of the conditions found present in this respect be again stated, as follows:

First. The brown rat (M. norvegicus) is generally on the decrease, and has practically disappeared in the area covered by class A, B, and C buildings.

Second. The black and roof rat (M. rattus and M. alexandrinus) is reinfesting premises formerly occupied by the brown rat.

Third. This substitution takes place principally in theoretically rat-proof buildings, chiefly through neglect of unnecessary or accidental openings.

Fourth. Because of the elimination of their natural enemy, the large, fierce Norway rat, from the water front, the two smaller ship-borne varieties now find entry and lodgment at this port less difficult.

Fifth. Rattus and alexandrinus, because of their ability to live above ceilings, between walls, and on roofs, and because of great cunning and trap shyness are more difficult to reach with poisons and traps, and because of great agility as climbers are more difficult to confine or control.

To meet these conditions the following measures were put into effect for the eradication of black and roof rats and have been carried on consistently throughout the past fiscal year:

First. The detail of inspectors who devote their time to ferreting out these accidental openings occurring in such buildings, serve the necessary notices for their closure, and follow up with reinspections to see that the instructions given have been put into effect.

Second. Increase in trapping operations within and on the roofs of such buildings and thorough poisoning of their interiors wherever practicable.

Third. Condemnation and demolition of temporary frame structures within the fire limits.

Fourth. Greater vigilance toward preventing the escape of rats from ships.

The following is the summary of such work during the last fiscal year:

Buildings in fire limits rat-proofed.

Buildings abated	214
Ventilators on roofs screened	643
Ventilators in basements screened	319
Unused chimney flues screened	592
Windows screened	204
Sidewalk gratings screened	364
Lens lights replaced	5, 948
Doors rat-proofed	57
Inclosed dead spaces opened up	36
Openings around pipes closed with cement	5, 626
Conduits closed with cement	287
Openings in walls, ceilings, and floors closed by wire, lath, and cement	4, 910
Floors complying with section 199 (wire cloth)	42
Area (square feet)	62, 196
Wood floors removed	26
Area (square feet)	37, 288
Floors concreted	120
Area (square feet)	133, 503
Finished ceilings removed from basements	17
Area (square feet)	30. 312

As definite proof of the value of this character of rat-proofing work, attention is drawn to chart 2, on page 230, which shows the curves in the comparative rat catch from 1908 to 1914, inclusive.

It will be noted that since the middle of 1912, when these operations had had time to begin to produce their effect, the curve of the catch of black and roof rats ceased to rise, in spite of increased efforts to catch these rodents, and, not only has it not risen again nor remained stationary, but shows a decided tendency to fall—this with the same number of men employed in the total trapping operations, whose efficiency through years of elimination and experience is unquestioned.

The repairing of nonrat-proof buildings with rat-proof materials, with special reference to premises occupied for the handling or sale of foodstuffs, or the vacation or demolition of such structures.—As a result of service operations in shutting off the garbage and other loose food supplies from the rats, a tendency has been noted on their part to leave many wooden buildings which are potentially good rat harbors, and to congregate around certain places, even overcoming obstacles to do so, where foodstuffs are handled or prepared for sale.

City ordinances require that the floors of all buildings used as fish markets, bakery shops, sausage factories, candy factories, and other places where foodstuffs are prepared for sale, shall be constructed of 2 inches of concrete trowelled to a smooth surface. Floors of mastic or other patent water, fire, and rat proof material may be substituted for the concrete if desired.

Similarly, the floors of meat markets, butter shops, vegetable stores, restaurants, and bakery stores must be constructed of two layers of boards driven tight, and between said two layers shall be placed galvanized iron cloth of not less than No. 20 gauge wire, whose mesh is not more than one-half inch. Said cloth shall extend over the entire area of floor and up on all walls at least 8 inches in height, and shall be covered by a baseboard nailed to the walls.

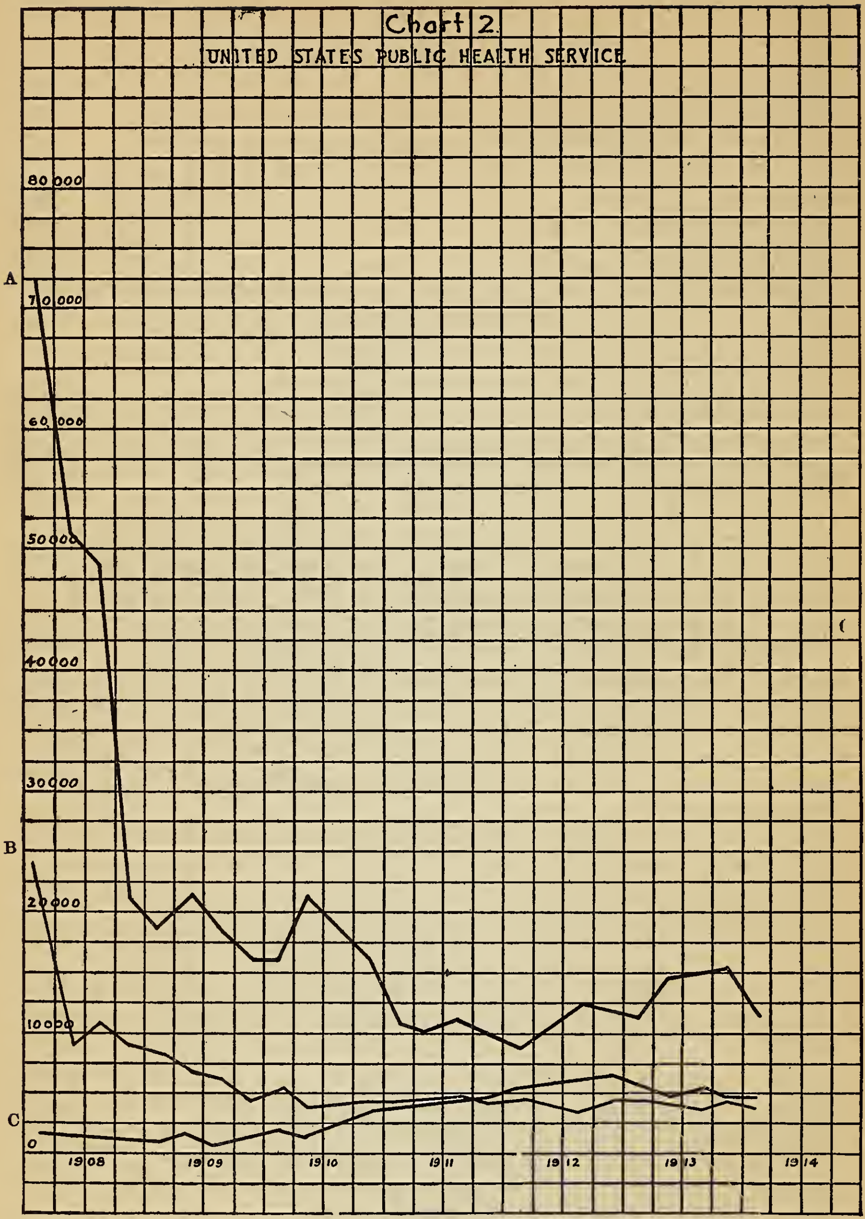


Chart Showing Quarterly Catch of Four Varieties of Rodents in San Francisco from 1908 to 1914.

Line A, mus norvegicus; line B, mus musculus; line C, mus rattus and alexandrinus.

The provision of the double floor and wire mesh may be omitted providing the basement is concreted and the brick or concrete area walls come up to the floor level and no basement ceiling exists.

All buildings containing places engaged in the manufacture and sale of foodstuffs of the above-mentioned character are visited by the inspectors of the service and if found not to comply with the requirements as laid down above, their owners are requested to comply with the city ordinance relating to rat-proofing and all other requirements necessary to place them in a sanitary condition. When the owners after due notification and the elapse of reasonable time have failed or neglected to comply, the case is transmitted to the board of health with recommendations for condemnation proceedings, to the end that the premises be either repaired as required by law or vacated and demolished.

Result following board of health action in condemnation proceedings during fiscal year.

Buildings submitted to board of health for condemnation	350
Buildings acted upon by board and condemned	286
Buildings acted upon by board but not condemned	119
Buildings recommended for condemnation but not yet heard by board	71
Buildings given rehearings by the board	614
Buildings abated following condemnation proceedings[1]	401
Buildings condemned and remaining unabated	180

The following table shows the work accomplished during the past year in the shape of remodeling nonrat-proof buildings, using rat-proof materials.

Existing nonrat-proof buildings repaired, using rat-proof materials.

Buildings rat-proofed by concreting		1,201
Basements concreted (424)	square feet	517,602
Floors concreted (898)	do	1,336,737
Yards concreted (384)	do	213,300
Passageways concreted (194)	do	34,159
Sidewalks concreted (414)	do	305,672
Stables concreted (119)	do	227,605
Chicken yards concreted (153)	do	14,094
Total laid in old premises	do	2,649,169
Area walls installed		409
Area (cubic feet)		203,260
Buildings rat-proofed by area walls and wire cloth		174
Area (square feet)		176,141

On February 26, 1914, an ordinance was passed requiring all persons desiring to maintain a stable of any character within the city and county of San Francisco to secure a permit for same from the board of supervisors, and on March 18, 1914, a similar ordinance was passed in regard to those desiring to maintain laundries.

The following gives the amount of special work engendered by these new ordinances and accomplished from date of their passage to the end of the fiscal year:

Laundries seeking permits inspected and requirements sent	70
Stables seeking permits inspected and requirements sent	271

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[1] These include some buildings condemned during previous years, hence totals will not balance.

The application of rat-proofing measures, as carried out in the manner above mentioned, is bound up with and carries with it the enforcement of all other building and sanitary ordinances affecting the premises or the business conducted therein.

This rat-proofing work is primarily structural sanitation, but as carried out in dwellings it is practically embraced in the term known in hygiene as "housing." As carried out in places handling foodstuffs, it is practically general sanitation, and as such is of incalculable benefit to the general public.

The resultant necessary conferences, inspections, and decisions occupy the largest share of the administrative time of this office. It constitutes probably the most important work carried on by this division at present, and in its benefits and effects is of the utmost importance to the city and to the public health.

Measures taken to free shipping of rats—Cooperating with the chief quarantine officer.—This work has been redoubled at San Francisco during the past fiscal year, owing to the finding of a plague-infected rat at Seattle on September 30, 1913, and others at intervals throughout the balance of the year. There is a heavy coastwise traffic between Seattle and this port, and San Francisco was therefore menaced from that direction as well as from China and the Philippines, where plague, both rodent and human, has been endemic throughout the year.

The department's quarantine regulations have been strictly enforced at this port.

In the annual reports for the year 1912 and 1913 it was noted that the Norway rat constitutes a very small percentage of the rats trapped or found dead after fumigation on transoceanic ships. This observation remains true for the fiscal year 1914. During the period 4,800 rats were collected on ships, exclusive of 238 mice found dead after fumigation, and but 12, or one-fourth of 1 per cent of the total, were Norway rats, the balance being black and roof rats, and of the 12 Norway rats only 5 were found on deep-sea ships.

The following tabulation shows the operations of this office in connection with shipping and along the water front:

Measures taken to free the water front and shipping of rats.

Inspections made of vessels for rat guards	324
Vessels inspected for rat guards	874
Reinspections made on vessels	1,253
New rat guards procured	1,132
Defective rat guards repaired	808
Vessels on which cargo is inspected [1]	9
Pieces of cargo inspected for rat evidence	8,605
Rats trapped on wharves and water front	1,545
Rats trapped on vessels	2,203
Average number of traps set on wharves and water front:	
Cage	11
Snap	477
Average number of traps set on vessels:	
Cage	9
Snap	458
Vessels trapped on	220
Times trapped on	1,580
Ships fumigated	105
Total number of fumigations of ships	120
Vessels searched for dead rats after fumigation [2]	113

---

[1] 36 times.

[2] 7 left port unexpectedly early before being searched.

Dead rats found on vessels after fumigation: M. norvegicus, 5; M. rattus, 875; M. alexandrinus, 1,717; total		2, 597
M. musculus taken dead from vessels after fumigation		238
Poisons placed on water front	pieces	569, 950
Poisons placed on vessels	do	4, 800
Poisons placed within Panama-Pacific International Exposition grounds, pieces		200, 600
Bait used on water front and vessels (bacon)	pounds	347
Amount of bread used in poisoning water front	loaves	1, 899
Poison used on water front	pounds	945

Studies and plans connected with rat-proofing the city sewer system.—An examination of the rat-trapping records of the San Francisco office showed that about 13 per cent of all rats trapped were being caught in the sewers. These were caught with but about 3 per cent of the total traps in use, showing that proportionally more rats were caught in the sewers than anywhere else.

The problem of rendering the city generally rat proof could not be completely solved till the great harbor and highway for travel afforded the rats by the sewers be eliminated as such.

The main portals of entry to and exit from the sewers used by the rats are the corner catch basins.

This was found to be the case for the following reasons:

First. The openings in basin inlet gratings necessary for the proper admission of storm waters or other waters accumulating in the street are in every case sufficient in size to permit easy passage of rats.

Second. The traps of very few of the basins inspected contained water, and in a city with a long dry season, unless mechanically filled with water, such traps are inefficient as such, and in the absence of water offer no obstruction to the passage of rats.

Third. Practically all catch basins contained dry or semidry sediment up to the level of the trap outlet to the sewer. This sediment raises the bottom of the basin to within 20 to 27 inches of the street level. Rats very readily jump 2 feet vertically and coming from the sewer easily leap upward the distance required to reach the openings in the gratings.

For the purpose of preventing egress of rats from the city sewers, an improved type of corner catch basin was devised.

Two diagrams are shown on pages 234 and 235. One is the prevailing type of corner catch basin in use in San Francisco, the other the proposed or remodeled new type of rat-proof and mosquito free corner gutter drain.

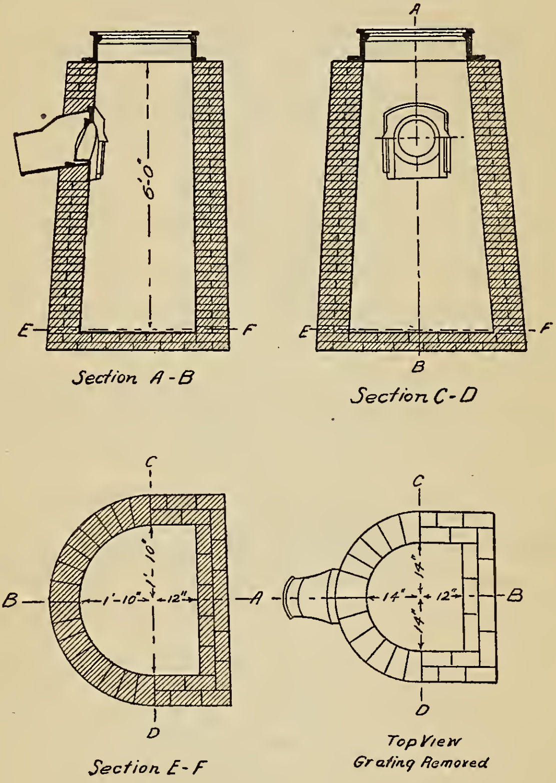
The new type proposed by the service is both simple and effective. It consists of two sections of smooth, vitrified pipe. The upper one cylindrical, 3 feet in length, and from 1 to 2 feet in diameter inside measurement; the lower one, a reducing elbow bent at a little less than a right angle and narrowed to fit the sewer lateral.

By the use of this installation, though rats from the street may enter the sewer through the corner gutter drains, they will be unable to return, as the vertical jumping distance is too great and the slippery sides offer no foothold either for direct climbing or for a running, carrom jump.

The cost data of replacing the 18,000 corner catch basins in the city with the proposed new type was computed, and it was found that it would pay for itself in 10 years by the saving effected in the expense now necessary for cleaning out and oiling of the type in present use. The question of installing this basin is still under consideration by the city authorities.

STANDARD DETAILS FOR SEWERS

CATCH-BASIN
with Trap Valve.
Scale $\frac{1}{4}$"=1'

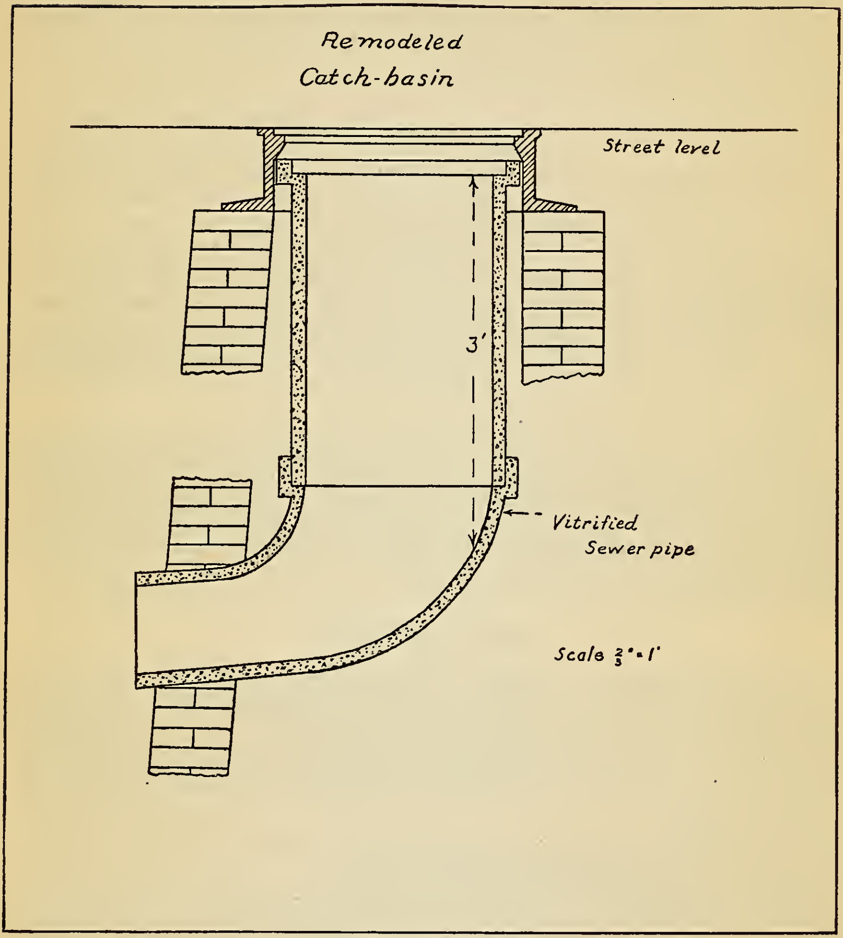


Section A-B

Section C-D

Section E-F

Top View
Grating Removed


Remodeled
Catch-basin
Street level
3'
Vitrified
Sewer pipe
Scale 2/3" = 1'

OPERATIONS IN OAKLAND AND BERKELEY.

Operations in Oakland and Berkeley have consisted solely in the trapping of rats for the purpose of determining whether plague infection had appeared in those cities. During the year 30,652 rats were collected in Oakland and Berkeley and sent to the laboratory for examination. No plague infection was found.

Trapping was discontinued in these cities in April, 1914, due to the necessity for reducing expenditures. Negotiations are now pending which, it is hoped, will result in these cities taking up the work of trapping under service supervision; all rats caught to be sent to the service laboratory for examination.

OPERATIONS FOR THE ERADICATION OF PLAGUE AMONG GROUND SQUIRRELS.

Squirrel-free zone.—The squirrel-free zone around the cities bordering upon San Francisco Bay, which has been described in previous reports, was maintained by the service until the latter part of December, 1913. It was then discontinued, partly on account of the necessity for distributing the men to various points within the infected counties as field inspectors, and partly for the reason that certain landowners complained that the service was doing work on the lands within the zone and at the same time compelling adjoining property holders to eradicate squirrels on their lands at their own expense.

A total of 11,741 acres of land were treated on this zone to the date of discontinuance of the camp. The work that had been done upon this zone during this and previous years has been productive of good results. Squirrels are now very scarce on an area approximately 16 miles in length and 2 miles in width. No infection has been found upon this area for over two years.

FIELD OPERATIONS.

1. Nine counties, in which plague-infected squirrels had been found, were divided into districts of approximately 40,000 acres each.
2. Each county was placed under the direction of a supervising inspector responsible to headquarters; each 40,000-acre district was placed under the charge of a field inspector responsible to the supervising inspector.
3. The field inspectors were directed to serve notices, as provided by law, upon the owners of infested lands.
4. At the expiration of 10 days the field inspector reinspected the property, to determine whether eradication measures had been instituted by the owner. If measures of eradication had not been instituted by the owner, as the law required, the field inspector requested the owner of the land to state a definite date, as early as possible, when he would begin work.
5. If the work of squirrel destruction had not been instituted on or before the date agreed upon, the field inspector reported the facts to the supervising inspector. The supervising inspector then collected such data as was necessary for the information of the officer in charge and forwarded the same to headquarters with a request for instructions.

6. When the report above mentioned was received at headquarters the supervising inspector was either directed to go upon the land as soon as possible and destroy the squirrels that infested the same, or a force of State employees was directed by headquarters to proceed upon the land and do the work. When the work was completed a statement of the expense incurred was submitted to the owner, and he was given an opportunity to pay the same if he so desired. If the bill was not paid as presented, the same was forwarded to the State board of health to be collected in the manner provided by the act of the California Legislature approved June 7, 1913.

It became necessary during the fiscal year to proceed upon the lands of 53 persons, comprising a total of 11,300 acres. An idea of the cooperation obtained from individuals in the destruction of squirrels may be gathered from the fact that out of a total of 33,350 inspections of ranches made during the fiscal year only 53 ranches had to be proceeded upon in a summary manner as provided by law.

OPERATIONS EAST OF THE SAN JOAQUIN RIVER.

Most careful and intense hunting carried out in this district has demonstrated that squirrels are now so scarce in that vicinity that hunters are able to turn in an average of less than one squirrel per hunter per day. No plague infection was found.

OPERATIONS IN ALTAMONT PASS.

This township has been in the past probably one of the worst infected spots in the State and furnished a larger percentage of plague-infected squirrels for the area involved than any other area of equal size within the State. During the year hunters were not able to turn in over three or four squirrels per man per day on an average. No plague infection has been found since August or September, 1912.

INSPECTION OPERATIONS.

During the year inspection of land and serving of notices has been carried on as outlined earlier in this report. Operations have been conducted in the following counties: Contra Costa, San Benito, Santa Clara, Merced, Stanislaus, Alameda, San Joaquin, Santa Cruz, and Monterey.

A total of 33,350 inspections, over an area of 5,722,438 acres, has been made during the year. Reinspections have been made over 6,903,307 acres, and a total of 1,909,728 acres has been treated by landowners as a result of the inspections made and notices served.

Hunting operations.

Ranches on which plague-infected squirrels have been found since August, 1908		252
Ranches hunted over during fiscal year		2, 525
Squirrels shot	18, 012	
Squirrels found dead	414	
		18, 426
Squirrels examined		18, 322
Squirrels infected with plague		177

At the close of the fiscal year ended June 30, 1913, there were 135,146 acres of known infected land. During the fiscal year infection was found on 15,005 acres of land where infection had never before existed. The total area of infected land June 30, 1914, was 150,151 acres. In addition to the 150,151 acres of infected land just mentioned, there were 90,405 acres of land which immediately surrounded or adjoined the infected land, which were subjected to the same intensive treatment that was given to the actually infected territory. The total area of infected and adjoining lands is therefore 240,556 acres.

All of the infected and adjoining land has been thoroughly treated, and so far as is possible to determine it is believed that plague infection has been entirely eradicated, except on about 20,000 acres, which require further treatment to complete the eradication of infection.

Summary of hunting operations for the period Apr. 1 to July 1, 1912, 1913, and 1914.

	1912	1913	1914
Ranches hunted over	723	990	1,464
Squirrels shot	19,335	16,186	13,162
Hunters engaged (average)	9	17	21
Average days each man hunted	64.4	49.4	57.2
Squirrels per hunter per day	33.3	19.2	10.5
Squirrels shot per ranch	26.7	16.3	8.5
Infected squirrels shot during period	506	283	44
Per cent of squirrels infected	2.61	1.74	0.34

Hunting operations over infected and adjoining territory are practically completed.

The 44 squirrels mentioned in the preceding table were found as follows:

County.	Ranch.	Infected squirrels.	Completed or working.
San Benito	McCray	2	Completed.
Do	Paicines	7	Working.
Monterey	Kelley	1	Completed.
Contra Costa	Vasco Grant	5	Working.
Do	Crocker	1	Do.
Do	Walnut Creek district (small lots, area 714 acres).	17	Do.
Alameda	Fredericks	11	Do.

Of the 44 infected squirrels shot during the hunting season of 1914, only 2 had the disease in the septicemic form. These 2 squirrels were found as follows: One on the McCray ranch in San Benito County, 1 on the Vasco Grant in Contra Costa County.

As may be seen from the summary of hunting operations above given, there has been a reduction in the number of squirrels shot per hunter per day in 1914, as compared to the same period in 1912, of 68.5 per cent; as compared to 1913 there has been a reduction of 45.3 per cent. The reduction in the number of squirrels shot per ranch in 1914 as compared to 1912, is 68.2 per cent, and as compared to 1913, is 47.9 per cent. The reduction of infection in 1914 as compared to 1912 is 91.4 per cent; as compared to 1913, is 84.5 per cent.

Human cases.—Two human cases of plague occurred during the fiscal year. One case was that of a cook in a railroad camp in Contra Costa County. The disease was bubonic in type and resulted fatally. The other case occurred at Walnut Creek, in Contra Costa County, was mild bubonic in type, atypical in course, and the patient made a prompt recovery.

Special projects.—During the fiscal year expert supervision has been furnished to 107 landowners, who have paid all expenses in carrying out squirrel-eradicative measures on their land. Six hundred and twenty-five thousand one hundred and fifty-four acres have been treated in this manner and has given satisfactory results.

Laboratory operations.—During the fiscal year 18,426 squirrels were received at the laboratory, and of this number 18,322 were examined; 177 were proven to be infected with plague. Ninety-two thousand three hundred and seventy-three rats were received from the cities of Oakland, Berkeley, and San Francisco; 74,120 rats were examined, none of which were found infected with plague.

During the latter half of the fiscal year it has been observed that the virulence of the plague-infecting organism has been greatly decreased. This is due to the fact that the great reduction in the number of ground squirrels has rendered the passage of the plague bacilli from one animal to another more difficult, and thus the virulence decreases.

A series of experiments has been conducted for the purpose of determining, if possible, why plague is not present among ground squirrels until after approximately the 1st of April each year, which is the season of the year when the young squirrels are born. These experiments tend to show that active plague develops as a result of pregnancy in squirrels affected with chronic abscesses of lymphatic glands, liver, or spleen. It is possible also that the young are infected with plague, either in embryo or immediately after birth, where the mother squirrel has plague. Further work is needed along this line for definite confirmation.

In addition to the above, the following analyses and experiments have been made:

Blood, Wassermann	364
Blood, Widall	25
Urine, Diazo	19
Urine complete	17
Gastric	14
Histological	12
Feces, for typhoid bacilli	108
Water (Angel Island)	6
Water (Marine Hospital)	2
Tuberculosis (sputum)	6
Diphtheria (Isolation Hospital)	122
Spinal fluid (Isolation Hospital)	4
Miscellaneous bacteriological smears (Isolation 7; Marine 1)	8
Rat poisons	7
Squirrel poisons	Several.
Milk	1
Oil film experiments (for mosquito prevention)	2

General considerations.—On account of the fact that in several instances, notably in Santa Clara and San Benito Counties, infection had been found in places where it had never existed before, and also for the purpose of so diminishing the squirrels in the various infected counties, that opportunity for the spread of the disease from known or undiscovered foci could not exist, it was deemed best to cause the destruction of squirrels over as wide an area in the infected counties as possible, instead of confining efforts solely to the cleaning up of known foci of infection. The wisdom of this policy is indicated by the fact that squirrels have been markedly diminished in numbers over a very large area, infection among them has been reduced to the lowest point it has ever been, hunting has failed to reveal any noticeable spread of the disease, the virulence of the plague organism has diminished, and landowners are much more content with the economic benefits derived.

The belief that had heretofore existed throughout the State, that the problem of squirrel destruction was impossible of solution, is gradually losing ground, and representatives of counties in which plague infection has never been demonstrated have requested this office to lend assistance in the organization of a campaign of squirrel destruction within said counties. Inasmuch as plague infection had never been found within these counties, it was impossible to comply with the requests, beyond giving such general advice as seemed appropriate.

In several instances large tracts of land have had the squirrels that infested them destroyed by the turning in of irrigation water to drown them out. The largest single tract thus freed of squirrels comprised an area of 20,000 acres.

As nearly as can be learned, about 1,500 squirrel destructors have been used by the various agencies engaged in squirrel destruction. A total of 402,280 acres of land have been treated by this means, with, as nearly as can be determined, an average efficiency of from 95 to 100 per cent for the first application.

During the year a new method of using waste balls in the destruction of ground squirrels has been devised. Heretofore the expense attached to the use of the waste-ball method has been between 3¾ and 5 cents per hole for labor and material. As a result of the system in use during the past rainy season the expense per hole has been reduced to about 2 cents for labor and material. The system in use is, briefly, as follows: A unit gang of seven laborers was required. A live, active man was selected to place the balls in the holes. He was kept supplied with a bucket of saturated waste balls and a bundle of galvanized iron pins with a white flag attached, similar to the pins used by engineers. The "ball man" placed a ball in each hole encountered and placed a pin close to it. Two torch men followed, igniting the balls. Three men with mattocks followed the torch men, covered the holes, and removed the pins. A supply man was utilized to keep the ball man supplied with material, that no time be lost. Where sufficient labor was available, one supply man could keep two gangs of six moving constantly, thus obviating the necessity for the services of one supply man. By this means, in heavy infestation, 400 to 500 holes per man per day have been treated.

The average for all infestation runs in the neighborhood of 200 to 300 holes per man per day, depending upon the topography of the ground. The efficiency of the method has run between 85 and 95 per cent. The principal advantage of this method is that the ground can be rapidly covered and all burrows and colonies are filled with poisonous fumes in a very short space of time, thus insuring the destruction of the majority of the squirrels before they are able to dig out and escape. This method, however, is applicable only in the wet season when the ground is damp and there is no danger of the dissipation of the gas through cracks in the ground or danger of starting grass or grain fires where dry vegetation exists. A total of 503,125 acres were treated by this method.

The following table will show the results of operations as reported by field inspectors and supervising inspectors from the various counties. This table was compiled from the daily report cards of the various inspectors, and has been verified as nearly as possible by surveys made from time to time by representatives from headquarters. It is believed that the figure of 73.8 per cent eradicated is as nearly accurate as it is possible to obtain.

Recapitulation—Table showing infestation in plague-infested counties in California to June 30, 1914.

County.	Total area.	Area eradicated.	Percentage eradicated.	Area squirrels 1 to 5.	Percentage eradicated 1 to 5.	Area squirrels 5 to 15.	Area squirrels 15 and over.
	Acres.	*Acres.*		*Acres.*		*Acres.*	*Acres.*
Alameda	537,600	425,253	79.1	103,405	98.3	7,306	1,636
Contra Costa	480,000	435,568	90.7	34,742	97.9	9,690	....
Merced	1,120,000	507,768	45.3	606,896	99.5	5,336	....
Monterey	2,208,000	1,999,512	90.5	181,379	98.7	26,244	865
San Benito	944,640	753,346	79.7	177,260	98.5	13,510	524
Santa Clara	867,200	769,709	88.7	72,980	97.1	5,140	19,371
Santa Cruz	272,000	255,236	93.8	16,414	99.8	350	....
San Joaquin	876,800	771,272	87.9	102,428	99.6	3,200	....
Stanislaus	951,040	183,861	19.3	438,000	65.3	184,539	144,640
Total	8,257,280	6,101,525	73.8	1,733,504	94.8	255,315	167,036

Average eradicated, 73.8 per cent; average eradicated and 1 to 5, 94.8 per cent.

The following table summarizes the total amount of lands treated, the number of acres treated by the various methods, and indicates the cost of all operations, as closely as the same can be figured:

Recapitulation of squirrel-eradicative work, 1913–14.

	Grain.	Waste balls.	Destructors.	Total.
	Acres.	*Acres.*	*Acres.*	*Acres.*
By individuals	1,251,836	398,569	251,323	1,901,728
Federal camp	3,521	....	8,220	11,741
Special projects[1]	386,270	99,940	138,944	625,154
State camps	2,891	4,616	3,793	11,300
Grand total	....	....	....	2,549,923

[1] Labor and material furnished by owners; supervision by service.

Total number acres treated, waste ball and destructors, 905,405.

Number of holes treated.

Waste ball and destructors:	
By individuals	3,176,206
Federal camp	244,295
Special projects	1,894,174
State camps	241,653
Total	5,556,328
Average number of holes per acre	6.15
Total number of holes treated on 2,549,923 acres, at 6.15 holes per acre	15,650,000

Cost data.

	Pounds used.	Cost.	Cost of labor.	Total cost.
By individuals.				
Grain	472,123	$35,409.22	$145,694.25	$181,103.47
CS_2	182,220	16,399.80	10,496.00	26,895.80
Kilmol	147,570	16,232.70	11,189.80	27,422.50
Total				235,421.77
Special projects.				
Grain	125,231	9,392.32		
CS_2	117,740	10,596.60		
Kilmol	81,060	8,916.60		
Total		28,905.52	29,486.44	58,391.96

Federal:		
Headquarters—		
Salaries	$9,929.49	
Rentals	1,325.78	
		$11,255.27
Field—		
Salaries	79,449.69	
Livery	2,618.00	
Supplies	1,476.95	
Freight and travel	210.00	
		83,754.64
State		35,866.80
Counties		19,157.32
Oakland County (1 man)		1,640.00
Cost of material and labor (individuals)		235,421.77
Cost of material and labor (special projects)		58,391.96
Total cost		445,487.76

Average cost per acre, $0.174; average cost per hole, $0.0284.

SUMMARY OF RESULTS.

Through the operations that have been conducted in the cities around San Francisco Bay, sanitary conditions have been materially and constantly improved.

Through the operations conducted for the purpose of destroying ground squirrels, the reentrance of infection into any of the bay cities has been prevented.

So far as it has been possible to determine, by careful and intensive hunting, all known plague infection has been eradicated from the State of California, with the exception of five foci which are now being worked and should be completed by the 1st of August, 1914.

As a result of the systematic methods of operations and the efficient means of eradication that have been used throughout the year, it has been demonstrated that squirrels can be effectively and economically destroyed.

Landowners generally have been instructed in squirrel eradication and large numbers have become convinced of the benefits to be derived from squirrel destruction, and it is believed that with a small number of inspectors continuously in the field for the purpose of maintaining the interest that now exists, the work of squirrel destruction will be continued indefinitely by individuals, in a much more efficient and systematic manner than has before obtained.

PLAGUE SUPPRESSIVE MEASURES IN SEATTLE, WASH.

Surg. B. J. Lloyd has been in charge of antiplague operations in Seattle.

Plague was first known to exist in Seattle, Wash., in October, 1907, during which month there were seven deaths among human beings from plague.

The first infected rat was found November 7, 1907, and from time to time others were found until September 26, 1908. There was then a break in the continuity of infected rats, and from this date until February 8, 1910 (nearly 17 months), none was found. On this latter date an infected rat was picked up; then there was another lapse of more than a year, when an infected rat was found on August 25, another on September 20, and a third on September 25, 1911. It is interesting to note here that the rat found on September 20, 1911, was picked up within two blocks of where the one which was found 17 months previous had appeared, on February 8, 1910. After this there was a lapse of almost two years, until September 29, 1913, when an infected rat was found. Since that time 32 infected rats have been found in various parts of the city.

It should be stated that the work of trapping and picking up dead rats had been continued during the interval of two years mentioned above, and in order not to overlook the disease in rats turned in, inoculations were made from practically all rats, whether they were trapped or picked up.

Rats picked up dead were given a separate inoculation; the daily catch of trapped rats was divided into three or four lots; a small piece of spleen was taken from each rat of a given lot; these bits of spleen were ground up in a mortar and the whole mass inoculated into a guinea pig subcutaneously.

As soon as the first provisional diagnosis was made in an infected rat found September 29, 1913, the Surgeon General of the Public Health Service and the city and State commissioner of health were notified. The Surgeon General urged that prompt and efficient measures be instituted, and after a conference with the city and State health commissioners it was decided to order the evacuation and destruction of various rat-infested buildings. On account of the proximity of certain of the foci of infection to the water front it was decided to fumigate twice in succession all steamers which might have been exposed to infection in Seattle, provided such steamers were engaged in foreign or interstate commerce. The State commissioner of health, after conferring with the Surgeon General, named Surg. B. J. Lloyd as deputy health commissioner and clothed him with authority to take the same precautions with the local fleet as outlined above. In addition to the two successive fumigations, vessels were required to fend off at least 4 feet from the wharf and place on all lines, hose, and hawsers leading to wharves standard rat guards not less than 3 feet in diameter.

With vessels engaged in purely interstate traffic only one fumigation was carried out, and because of the lesser danger during daylight hours they were not required to fend off or use rat guards in the daytime.

A committee of prominent business men was formed to cooperate with the city health commissioner in the work. This committee meets from time to time in conference with the city health commissioner and the State and Federal health officers. About December 10, 1913, after a conference with the mayor and council and citizens' committee the State health commissioner and Surg. B. J. Lloyd, of the Public Health Service, the work of trapping and picking up dead rats and the delineation of the infected zone were placed under the jurisdiction of the Public Health Service, the force being increased to 30 men, 25 of them being paid by the city, the other 5 being expert rodentologists transferred from the Public Health Service in San Francisco.

In addition to this work the city health officer has conducted a vigorous campaign directed against insanitary buildings and nuisances and in the zone of infection has rat-proofed about 3,000 buildings, this work having been done by the individual property owners under instructions from the city commissioner of health.

In the latter part of December, 1913, a death occurred in Seattle which was suspicious of septicemic plague (human). The smears from the spleen and from the surface of the brain showed microorganisms morphologically identical with B. pestis.

As this body had been embalmed, and thus the opportunity for diagnosis lost, the State commissioner of health required all bodies to be inspected by a representative of the health department before embalming, in order to avoid the possibility of overlooking a case of plague.

The Public Health Service, through its local representative, urged rodent examination for plague in other Sound and coast cities, and after conference with the local authorities the cities of Tacoma, Everett, Aberdeen, and Hoquiam began these examinations. The plan pursued was as follows: A number of men were employed to pick up dead rats, and one such man from each city was trained in the plague laboratory at Seattle to recognize suspicious rats and inoculate from them; upon the death of an animal inoculated from a suspicious rat the representative from the Public Health Service in Seattle was notified and visited the city in which the inoculation was made for the purpose of making a diagnosis.

Up to date no plague has been found in Washington outside of the city of Seattle, and no recent human case in Seattle, with the possible exception of the case reported above.

PLAGUE SUPPRESSIVE MEASURES IN PORTO RICO, JULY 1 TO OCTOBER 1, 1913.

During this period there were regularly engaged in this work 1 officer of the service, 5 foremen, 30 laborers, and 2 laboratory assistants. In addition, there were 1 foreman and 4 laborers on duty at the quarantine station, and 1 clerk in the city office.

The foreman and laborers first mentioned were engaged in trapping rats in the municipality of San Juan. In addition, the insular service of sanitation conducted extensive rat trapping in the other towns of the island. These were examined for plague infection at the laboratory.

During this period 17,524 rodents were examined at the laboratory; 12,366 being rats, 5,142 being mice, and 16 being mongoose. These were obtained from different localities as follows:

Locality.	Rats.	Mice.	Mongoose.	Total.
San Juan	2,296	1,435	....	3,731
Puerta de Tierra	1,435	762	2	2,199
Santurce	4,334	1,950	9	6,293
Carolina	42	11	....	53
Caguas	322	344	1	667
Ponce	8	4	....	12
Mayaguez	2,406	79	4	2,489
Arecibo	1,155	514	....	1,669
Aguadilla	368	43	....	411
Total	12,366	5,142	16	17,524

No plague infection having been found within this period, work was discontinued on October 31, 1913.

ROCKY MOUNTAIN SPOTTED FEVER INVESTIGATION AND ERADICATION DURING 1914.

The dipping vat at Victor, Mont., having been in operation for four consecutive seasons, investigations were made this year by Surg. L. D. Fricks, for the purpose of determining what results have been accomplished; first, by dipping alone; second, by dipping and animal destruction combined.

On a territory of 8 square miles, lying south of Bear Creek, from which the domestic animals have been regularly dipped since 1911, but no mammals killed, the ticks are still abundant. In fact, it is extremely doubtful whether there has been any diminution whatever in the number of ticks to be found there.

Just across Bear Creek, on the north side, and over an area of the same size, the small animals were systematically destroyed in 1911 and 1912, and since then they have been shot and trapped, and killed with carbon bisulphide each season. Domestic animals from this territory have been dipped in exactly the same way as those from the south side of the creek. There has been, however, a noticeable decrease in the number of ticks to be found on the north side of the creek.

From these observations it would seem that where the domestic animals are not more numerous than they are in the Victor dipping district, the dipping of domestic animals alone will not greatly decrease the general tick infestation in the foothills.

The State of Montana has provided by law for the dipping of domestic animals on the west side of the Bitter Root Valley, and the Public Health Service has had three vats in operation during the entire season of 1914. The working radius of these vats covers the west side of the valley from Big Creek to Darby, a distance of nearly 40 miles.

All cattle and horses suspected of harboring ticks within this territory have been periodically dipped this season, and by this procedure it is believed that some protection has been given the farmers in the immediate vicinity of their ranches. It is not believed, however, that the dipping of domestic animals alone will ever rid the valley of Rocky Mountain spotted fever.

The killing of small mammals has been continued west of Victor by shooting, trapping, and the use of carbon bisulphide pumps. Another similar site has also been selected west of the Hamilton vat, and the same procedure instituted there. In addition, the farmers of the west side of the valley have been encouraged and assisted in ridding their property of ground squirrels, which are by far the most numerous and dangerous animal pest in the valley.

Because of the practical difficulties encountered in carrying out any and all of the tick eradicative measures previously proposed, experiments were begun last season by Surg. Fricks with sheep grazing as a possible means of tick eradication. These experiments were continued during the present year. Two bands of dry sheep, one containing 500 and the other 1,000 sheep, were secured after considerable difficulty at the beginning of the season. They were driven onto the west side ranges early in April and remained there until the end of June, when the sheep were sheared and the experiment concluded for the year.

The two bands of sheep were grazed as closely as was consistent with their welfare, the larger band west of Victor and the smaller west of Hamilton, just north of Blodgett Canyon. They were inspected and examined for ticks regularly while grazing on the ranges selected, and at no time showed any ill effects from the experiment.

So far two things have been demonstrated by the experiment—first, that sheep can be successively grazed on the west side of the Bitter Root Valley and, second, that while grazing they will pick up and kill many ticks in their wool.

The final outcome of the experiment can not be determined until it has been continued for at least two years, since it requires that period of time for the average tick to attain maturity and because there are other benefits anticipated from the close grazing of tick-infested territory in addition to the destruction of the adult ticks in the sheep's wool.

From examinations made of the sheep while grazing, and at the time of shearing, it was estimated that two bands had destroyed within less than three months 25,000 adult ticks, and while this is by no means absolute proof that the sheep will eventually eradicate the wood ticks, it is more ticks than could be destroyed by dipping the other domestic animals from the same territory for 25 years.

The experiment having been concluded for the season with the shearing of the sheep, they will be dipped and returned to the owners as soon as practicable.

Eleven cases of Rocky Mountain spotted fever occurred in the Bitter Root Valley during the present season, with seven deaths and four recoveries. The deaths numbered the same as for the previous year, but the recoveries were more numerous, being 4 to 1. Two of the recoveries were in young children, which is not unusual, and two among adults, which is decidedly unusual in the Bitter Root Valley.

One case occurred near Victor. This was the first case which has been infected in this vicinity, exclusive of that of Passed Asst. Surg. McClintic, since the Public Health Service began operations here in 1911.

It seems possible that, with the decrease in the number of ticks, following the campaign of eradication, which has been conducted for the past four years, the virulence of the virus in the remaining infective ticks has been decreased.

Requests have been received from the secretaries of the State Boards of Health of Washington, Montana, and Wyoming, to make investigations of suspected cases of Rocky Mountain spotted fever reported from different points in these States during the present season. Some of these reported cases have already been investigated and the others will be at the close of this season's work.

There has been a decided increase in the interest taken in the study of Rocky Mountain spotted fever, particularly by the health officials throughout this region, and it is believed that within a very few years reports will be obtained for practically all cases of the disease which may occur. It will then be possible to carry on a comprehensive tick eradicative campaign in many of the infected areas.

In connection with the Rocky Mountain spotted fever eradicative campaign, two service publications have been issued. The first publication was Rocky Mountain Spotted (or tick) Fever, Sheep Grazing as a Possible Means of Controlling the Wood Tick (Dermacentor Andersoni) in the Bitter Root Valley. This appeared in Public Health Reports for August 8, 1913, pages 1650 et seq. The second publication was Rocky Mountain Spotted Fever, A Report of Its Investigation and of Work in Tick Eradication for Its Control During 1913. This appeared in Public Health Reports of February 20, 1914, and April 24, 1914, and has been issued as Reprint No. 169.

The results of sheep-grazing experiments may be summarized as follows:

SUMMARY.

1. Over 87 per cent of 295 ticks placed in the wool of unshorn sheep were recovered dead.
2. The majority of the ticks recovered from sheep grazing naturally over tick-infested territory were found dead.
3. Many of the engorged females recovered appeared not to have been fertilized.
4. Comparatively few ticks, either alive or dead, were found on the sheep after they had been sheared.

It is believed that these findings warrant the continuation of the experiment by the placing of a band of 2,000 wethers on some selected range west of the Bitter Root River as early in the spring as possible. The selected range should be closely grazed until shearing time, and then, if desired, the sheep could be sheared, dipped, and transferred to the east side of the valley without danger of carrying wood ticks, or returned immediately to the range until the experiment is completed.

Four factors are to be considered in the sheep-grazing experiments:

First. The removal of undergrowth and the consequent destruction of "good tick country" by close grazing.

Second. The destruction or removal of other large mammals, domestic and wild, from the sheep range.

Third. The destruction of ticks themselves by the grazing sheep.

Fourth. The placing of the problem of tick eradication on an industrial basis.

If this can be done the problem will solve itself, and the danger from Rocky Mountain spotted fever, which has hung like a blight over the eastern slopes of the Bitter Root Mountains for 30 years or more, will pass away.

SANITARY WORK IN ALASKA.

This work included (*a*) the supervision over all quarantine stations in Alaska, (*b*) the management of outbreaks of epidemics, (*c*) the enforcement of regulations for the prevention of the introduction and spread of contagious and infectious diseases into the Territory of Alaska and of regulations for the prevention and spread of contagious and infectious diseases from the Territory of Alaska to the United States, (*d*) preventing the spread of contagious or infectious diseases from one part to another part of Alaska; all under regulations promulgated by the Secretary of the Treasury under authority contained in the act of February 15, 1893.

In addition to the above duties, at the request of the Bureau of Education, Department of the Interior, Passed Asst. Surg. Emil Krulish continued (*a*) the supervision of all measures relative to the medical and surgical relief of the natives of Alaska, (*b*) studies of the prevalence of disease among natives and of conditions favoring its spread, with a view to inaugurating adequate measures for prevention, (*c*) instruction to the teachers in the Alaska school service in first aid to the injured and sick, and (*d*) acting in a general advisory capacity to the superintendent of education of the Territory of Alaska in all matters pertaining to hygiene, sanitation, maintenance of hospitals, and other matters of like character.

During the summer months, a sanitary survey was made by Dr. Krulish of the Eskimo villages along the Arctic coast of Alaska, as far north as Point Barrow, and the conditions in these villages were compared with those of the Eskimo villages of Siberia. An examination of the Indians in the villages of southeastern Alaska was completed during the winter.

Plans and estimates of expenditures for the establishment of a medical service for the natives of Alaska under the Bureau of Education with the advice and cooperation of the Public Health Service have been prepared and defended at hearings before the Committee on Appropriations in Congress at the request of the Commissioner of Education.

When possible the teachers of the Alaska school service were instructed in first aid to the injured and sick, the diagnosis and treatment of the common diseases of the natives, and in methods for the improvement of the sanitary conditions in the native settlements and homes; these teachers are the only "doctors" and health officers in the majority of the native communities. A medicine chest containing simple remedies was sent to each school, accompanied by a medical handbook especially written for the Alaska school service by Dr. D. S. Neumann, of the Bureau of Education, and Passed Asst. Surg. Krulish.

Individual towels and drinking cups have been introduced into the schools for the use of the pupils. These will in a great measure facilitate the prevention of the spread of tuberculosis, trachoma, and other communicable diseases among the native population. Lectures on elementary hygiene and sanitation were delivered before meetings of natives at several schoolhouses and these were supplemented by individual talks in the homes.

Relief was extended to the natives when needed, and the following surgical operations were performed by the service officer, the number being necessarily limited for the lack of proper facilities and assistants:

Adenectomy and tonsillectomy	16
Tonsillectomy, only	6
Excision of pterygium	6
Appendectomy, closure	1
Amputation, thigh	1
Amputation, fingers	2
Amputation, arm	1
Uterrine curretage	4
Omental adhesions, salpingitis	1
Repair of harelip	1
Intravenous injection salvarsan for syphilis	11

During the fiscal year smallpox was the only quarantinable disease reported in the Territory. One case appeared at the cannery at Uyak Bay, six cases developed at the cannery at Hoonah, and two cases were reported in Juneau. All these were white persons who entered the Territory as cabin passengers through the port of Seattle, Wash., and were not vaccinated prior to embarkation, as is usually required of steerage passengers.

Outbreaks of scarlet fever, measles, whooping cough, influenza, mumps, infantile paralysis, and diphtheria were reported both among the whites and natives in various sections of Alaska.

Special attention was directed during the year to the inspection of vessels for the purpose of enforcing paragraphs 13 and 14, article 3, Interstate Quarantine Regulations, prohibiting the use of public towels and drinking cups by common carriers engaged in interstate passenger traffic. In some few cases the steamship lines failed to comply with the provisions of the paragraphs in question, but after due notification thereof no further infractions of the law were noted.

Suggestions, advice, and assistance in matters pertaining to quarantine, the suppression of communicable diseases, and public-health legislation were extended to the governor of Alaska, who is ex officio commissioner of health of the Territory. An act to provide for the registration and restriction of communicable diseases in Alaska and an act to require the registration of vital statistics in the Territory were enacted by the Territorial legislature at its first session and became effective July 1, 1913; but the lack of funds necessary for the strict enforcement of these laws has greatly impeded public-health activities in Alaska. The text of the first act mentioned was drafted at the request of the governor and several members of the legislature.

The activities in connection with the construction of the proposed Government railroad and developments in other industries in Alaska are responsible for the increasing passenger traffic between Seattle and Alaskan ports, and will stimulate a heavy immigration in the future. In view of these facts it is obvious that the opportunity for the introduction of contagious and infectious diseases from the States into Alaska will be most favorable and the situation demands every precaution at the port of embarkation.

SANITARY INSPECTION OF GOVERNMENT BUILDINGS.

Inspection of the sanitary conditions of Government buildings in the District of Columbia, excepting those of the War and Navy Departments, has continued in accordance with Executive Order No. 1498 of March 15, 1912. All of the buildings covered by the order were inspected by Surg. B. S. Warren and Asst. Surg. R. A. Kearny, and appropriate recommendations and suggestions were made. Those responsible for the care of the buildings have in most instances endeavored to carry the suggestions into effect, although many have been hampered and discouraged in their efforts by the lack of suitable buildings and adequate appropriations.

A number of bureaus and offices have moved to new quarters during the year, which has resulted in much improvement of sanitary conditions.

During inspections all insanitary and unhygienic conditions, such as overcrowding, congestion, improper ventilation, insufficient lighting, poor water supply, lack of cleanliness, and unsatisfactory plumbing, were noted. Defects were pointed out during inspections, and a written report was made out after each inspection, addressed to the secretary of the department under whose jurisdiction the building came, and a copy was also sent to the Secretary to the President.

Cooperation of employees is an important factor in securing sanitary improvements, and much can be accomplished by obtaining the assistance of the employees through their good will and by enforcing regulations for the care of the building.

Overcrowding.—Many rooms were overcrowded; the air space being less than 500 cubic feet and the floor space less than 40 square feet per person. Overcrowding is conducive to insufficient ventilation, and close contact between employees increases the danger from transmissible diseases.

Congestion.—On account of lack of storage facilities, many rooms and hallways were congested with furniture, papers, etc., which prevented proper cleaning.

Ventilation.—During warm weather ventilation was obtained through open doors and windows. Electric fans were installed in most offices. During cold weather regulations were made in several buildings requiring the opening of windows for five minutes every morning and afternoon, during which time the employees were allowed to move about the rooms. This practice should be adopted in all Government buildings.

Lighting.—The natural light of many rooms is inadequate, necessitating the use of artificial light. Ribbed or prismatic glass windows were recommended for certain rooms in which the natural light was poor.

Heat.—Where steam or hot-water pipes were used for heating, either direct or indirect, the air was heated without addition of moisture, which produced a relatively low humidity and caused disagreeable symptoms among employees, and impaired their working efficiency. The condition was ameliorated by the opening of doors and windows at intervals during cold weather. The temperature of rooms should be 68° to 70°; never above 70° in winter; with relative humidity of 50° to 65°.

Water supply.—Water is obtained from the city supply. Inverted bottle coolers, which have been adopted in nearly all of the Government buildings in place of open coolers, reduce the danger of contamination. An individual drinking glass is provided each employee, to be kept at his desk. There is a tendency among a few employees to leave these glasses at or near the water coolers, where common use is made of them. Drinking fountains have been installed in a few places. The common towel has practically disappeared from the executive buildings. Individual towels, paper towels, and other devices which permit the using of a towel only once have been substituted for the common towel.

Cleanliness.—In practically every department the cleaning force is insufficient and as a consequence many offices are poorly kept. Most departments require their employees to keep the furniture, books, papers, etc., in the rooms in a neat and orderly arrangement, to expedite the work of the cleaning force. This has resulted in a marked improvement.

Plumbing, sinks, toilets, etc.—In most offices the plumbing was found in fair condition and well kept. In a few instances old and insanitary fixtures were noted and condemned. Several inside rooms in use for toilets were condemned and it was suggested that outside rooms be substituted for them.

Miscellaneous.—It is very essential that all chemical laboratories be equipped with electric fans.

Some buildings are not suited for the use made of them, and the only remedy in such instances would be the moving of offices from such buildings to new quarters.

Suggestion was made in the last annual report to have the inspection of Government buildings extended to executive buildings outside of the District of Columbia. This work has begun and several inspections have been made at St. Louis and San Francisco.

Recommendation.—In order that the reports of sanitary conditions may be of more value, it is recommended that records be kept of the morbidity and mortality among all Government employees to determine the effects of employment upon health. Sick reports are now kept in some of the offices. Such reports should be kept in all buildings and the reports made complete, showing dates of sickness, disease, results, and occupation of the individual.

USE OF COMMON TOWELS PROHIBITED.

During the year an Executive order was issued by the President of the United States directing that towels for the use of more than one person be discontinued in Federal public buildings. A copy of the order issued to all officers and employees of the Treasury Department by the honorable the Secretary of the Treasury, as department circular No. 20, follows:

PROHIBITION OF USE OF TOWELS BY MORE THAN ONE PERSON.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, October 11, 1913.

1913.
Department Circular No. 20.
Chief Clerk.

To all officers and employees of the Treasury Department:

The following Executive order has been received from the White House:

> It is hereby ordered, in the interest of the public health, that the use of roller towels and other towels intended for use by more than one person be discontinued in the public buildings of the United States.
>
> WOODROW WILSON.
>
> WHITE HOUSE, *September 30, 1913.*
>
> (No. 1833½.)

In accordance with the foregoing, the use of roller towels in the public buildings of the United States under the Treasury Department will be discontinued immediately.

W. G. McADOO, *Secretary.*

SANITARY INSPECTION OF THE UNITED STATES MINT AT SAN FRANCISCO, CAL.

An officer of the service, stationed at San Francisco, was detailed to make an inspection of the mint in that city, with special reference to heating, lighting, ventilation, overcrowding, safety appliances on machines, common drinking cups and towels, plumbing, drainage and sewerage, water supply, and general cleanliness. Everything was found to be in satisfactory condition, except the lighting of the main corridor on the first floor, to correct which recommendations were made. One employee was found to have tuberculosis, and precautionary measures were suggested.

SANITARY INSPECTION OF THE UNITED STATES PENITENTIARY, MCNEIL ISLAND, WASH.

At the request of the honorable Attorney General of the United States, an officer of the Public Health Service was detailed to make a sanitary inspection of the United States penitentiary at McNeil Island, Wash., and to make recommendations regarding such measures as might be found necessary to correct any insanitary conditions. A thorough study was made by the officer detailed for this work, covering the investigation as outlined below:

1. A general sanitary survey of the institution.
2. Examination of water supply.
3. Examination of each inmate, including full medical history and physical examination.
4. Special laboratory methods directed toward determining the prevalence of specific diseases.
5. Consideration of the measures taken to prevent the spread of disease.
6. Conditions affecting the personal hygiene of inmates, including their subsistence, clothing and bedding, facilities for bathing, and industrial conditions.

During the course of the examination the Wassermann-Noguchi serum test was applied to 181 inmates. Of these, 45 gave positive reaction. Eight cases of tuberculosis were also encountered. During the course of the physical examination an effort was made to classify the inmates of this institution according to their mental capacity. The results of this classification were as follows:

High mentality	18
Average mentality	128
Low mentality	48
Senile changes beginning	6
Weak minded, or possibly insane	5
	205

A full and detailed report was submitted to the Department of Justice, in which were set forth the result of the inspection and the recommendations of the inspecting officer. These recommendations were very comprehensive in scope, relating to the isolation of contagious diseases, prevention of fly and mosquito breeding, preparation of food, sterilization of bedding, care of prisoners' teeth, regulation of indoor temperature and ventilation, correction of water supply, and improvement of the general hygienic condition of the institution. Practically all of the recommendations have been carried out, under the direction of the Department of Justice.

Sanitation of Trains and Vessels.

Under the provisions of department circular No. 49, of October 5, 1912, all commissioned medical officers of the Public Health Service when traveling under official orders on trains and vessels engaged in interstate traffic are directed to make observation regarding the sanitary condition of the trains and vessels on which they travel and to submit such data as they may have collected to the bureau upon completion of the travel authorized. In each instance when an adverse report has been made, the common carrier has been notified and requested to remedy the conditions. As a result of these reports, special investigations have been directed to determine the morbidity from typhoid fever and gastroenteritis as a result of passengers consuming impure drinking water while traveling in interstate traffic. Two bureau publications have been issued giving the result of these special investigations. One report shows that of 235 passengers on one steamer on the Great Lakes, there occurred 122 cases of gastroenteritis and 42 cases of typhoidlike attacks, including 5 deaths. A complete report of this investigation, which was made by Passed Asst. Surg. Hugh de Valin, was printed in Public Health Reports of December 19, 1913, and also appeared as Reprint No. 157.

In connection with the investigation of the sources of water supplied for drinking purposes and of the methods of sewage disposal on ships on inland waters it has been found that there are more than 1,600 steam vessels operating on the Great Lakes alone, and during the last fiscal year more 16,000,000 passengers were carried by these vessels. It becomes apparent, therefore, that these inland vessels play an important rôle in the maintenance of the high typhoid fever rate in the United States. During the calendar year 1913, 144 cases of typhoid fever occurring among seamen on these lake vessels were treated at the stations of the Public Health Service in the Great Lakes region.

The degree of pollution of the Great Lakes and rivers contributary thereto is becoming a serious question. These large bodies of water are constantly becoming more polluted, thus lessening their value as a source of water supply. Practically all of these vessels secure the water used aboard for all purposes by pumping from the lake, through sea cocks which perforate the shell of the ship in the bottom, and unless great care is exercised in selecting proper areas for the replenishment of water pollution of the water supply is almost sure to occur. It has been recommended that whenever water is taken on board for drinking purposes it shall be done only by the order and under the supervision of a commissioned officer, and that an official entry shall be made in the ship's log stating the time and source of supply. On account of the increasing pollution of the Great Lakes by sewage and the constant danger in the use of such water no water which is taken on board at any place in the Lakes should be used for drinking purposes until it has been so treated that it is rendered absolutely safe. Some form of apparatus for the purification of water by the use of heat is recommended as likely to give the most satisfactory results in meeting the necessary requirements. In Public Health Reports of February 13, 1914, under the title, "The water supplies of ships," a full discussion of this subject is given by Passed Asst. Surg. de Valin. This publication also appeared as Reprint No. 168. As a result of the findings during the course of these investigations and in accordance with recommendations of the bureau there has been promulgated an amendment to the Interstate Quarantine Regulations covering the water supplied for drinking and cooking purposes to vessels engaged in interstate traffic. A copy of this amendment follows:

WATER FOR DRINKING AND COOKING PURPOSES FURNISHED INTERSTATE VESSELS.

(Amendment to Interstate Quarantine Regulations No. 7, Public Health Service.)

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, June 4, 1914.

To medical officers of the Public Health Service, State and local health authorities, and others concerned:

The following amendment is hereby made to the Interstate Quarantine Regulations promulgated by this department September 27, 1894, and amended August 17, 1905, June 24, 1909, May 15, 1912, October 30, 1912, December 9, 1912, and January 25, 1913, said amendment and regulations being in accordance with section 3, act of Congress approved February 15, 1893.

Article 3, General Regulations, is hereby amended by the addition of the following paragraph:

PAR. 16. No person undertaking to furnish water for drinking or cooking purposes to any vessel in any harbor of the United States intending to clear for some port within some other State or Territory of the United States or the District of Columbia shall furnish for such purposes water taken from the waters of such harbor or from any other place where it has been or may have been contaminated by sewer discharges. Any person violating this regulation will be liable to a penalty of not more than $500 or imprisonment for not more than one year, or both, at the discretion of the United States district court.

W. G. MCADOO, *Secretary.*

In order to immediately put into force the amendment covering water for drinking purposes furnished to vessels in interstate traffic, a commissioned officer was directed to proceed to Philadelphia and distribute copies of this regulation to the masters of all tugboats and other craft engaged in selling water to vessels at that port. Copies were mailed to all concerned at other ports.

WATER AND ICE SUPPLIED BY INTERSTATE CARRIERS.

A great amount of work has been done in connection with the enforcement of amendment No. 6 to the Interstate Quarantine Regulations promulgated January 25, 1913, by which all common carriers are required to furnish certificates of purity for the water and ice furnished on cars, vessels, or vehicles operated in interstate traffic for the use of passengers.

A card-index system of recording the sources of supply of water furnished passengers by common carriers has been inaugurated. Approximately 9,000 such sources have already been tabulated, and it is expected that a complete list of all sources of water supply, estimated at approximately 20,000 different sources, will be completed in the near future. The certificates required each six months from common carriers are checked against the tabulated list of supplies, so that it can be determined whether or not the regulation is being strictly complied with.

State and municipal laboratories are cooperating with the Public Health Service in securing certificates of purity for water and ice, as required by this regulation. The service has already inaugurated proceedings for the establishment of two Federal laboratories for the purpose of conducting these examinations of water and ice. A considerable number of sources of water supply have been condemned, and the use of water from such sources has been discontinued by the transportation companies in accordance with instructions issued by the Surgeon General.

INVESTIGATION OF MOSQUITO COMPLAINTS AND IDENTIFICATION OF MOSQUITOES, WITH PLANS FOR THE ABATEMENT OF SUCH NUISANCES.

Owing to an average mean temperature of about 60° F., summer and winter, in San Francisco, coupled with fogs, steady trade winds, sandy soil, and good drainage, mosquitoes rarely become a nuisance in that city.

During the summer of 1913 a prolonged period of dry and warm weather and the presence of water in the sewer catch basins contributed to produce an unusual condition that was favorable to the propagation of mosquitoes, with the result that they became a nuisance throughout the city, the first time in many years.

These water-filled catch basins, shaded and protected as they are, and favored by prolonged warm weather and absence of rain which would flush them out, were ideal mosquito breeding places.

Inasmuch as the Public Health Service had been, indirectly, one factor contributing to their presence, it was necessary to take steps to abate the nuisance. The catch basins were made to hold water to prevent egress of rats from sewers. Temporarily, several inspectors were taken off from other work and assigned to the investigation of these mosquito complaints. Specimens of the larvæ and adult mosquitoes were brought to the office for study and classification. They were propagated and examined for identification. But two species of one genera were found prevalent in San Francisco at that time, both members of the genus Culex, and identified as *Theobaldia incidens* and *Ochlerotatus lativittatus*.

Though *Anopheles maculipennis* is known to be present in the neighborhood of Burlingame and around San Rafael, none were encountered in San Francisco last summer. However, it is well known that, save in imported cases, malaria is a rare disease in San Francisco.

Experiments were conducted to determine if the larvæ would fail to develop in brackish and salty water, but both species continued active in water up to and above the percentage of saltiness of sea water, so that the idea was abandoned.

Oiling the surface of the catch basins was not practicable, as the street-washing operations caused the basins to be flooded and the oil film destroyed. An effective method was devised and tried in the laboratory, but was not used in actual work with the catch basins. After trial during the next breeding season the efficiency of the method will be reported upon.

COOPERATION WITH STATE AND LOCAL HEALTH OFFICERS IN RURAL SANITATION.

At the request of various local health officials and societies organized for the propagation of sanitary information, the Division of Interstate Quarantine has caused a large number of lectures to be delivered at various towns and communities. These lectures have been the means of creating interest in sanitation in the communities where they were delivered, and a marked improvement in the sanitary environment has been noticed. These lectures have principally dealt with questions of water supply and sewage disposal for rural communities, the prevention of fly and mosquito breeding, and kindred subjects. To make the lectures more attractive a large number of stereopticon slides have been prepared and have been used throughout the year by service officers in connection with their lectures. During one sanitary campaign moving pictures were made depicting the progress of the work. This film has been exhibited in various communities and has met with approval from local health authorities wherever it has been shown.

SANITATION AND EMERGENCY HOSPITAL WORK, PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

In accordance with authority of the Secretary of the Treasury given March 31, 1913, Surg. R. M. Woodward and Surg. J. D. Long have continued to conduct the emergency hospital and to direct the sanitation on the grounds of the Panama-Pacific International Exposition. A model hospital building has been constructed by the exposition authorities and has been furnished throughout with the very latest appliances for the care and treatment of sick and injured persons. During the period of construction of the exposition buildings approximately 600 patients were treated in the emergency hospital. In connection with this hospital there has been established a library of reference medical works, which already numbers 581 books and is constantly being increased. The lighting of the various wards will be by different methods; one ward has indirect lighting, another ward has the combined direct and indirect lighting, and the operating room has a system of lighting designed especially for this purpose. Two automobile ambulances have been secured, equipped with upper and lower stretchers, electrically lighted inside, and with all modern appliances for the comfort of the patient. The work of equipping the hospital has been accomplished without expense to the Government, except for the salaries and expenses of the officers detailed for this purpose.

Through the service exercising control over the sanitation of this international exposition, there will be no danger from the spread of disease in interstate traffic, through the congregation of so many people from various parts of the world, which might readily result in the propagation of communicable disease. The equipment and operation of the hospital not only affords protection for visitors to the exposition, but will have a considerable educational value.

SERVICE EXHIBIT AT THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

The exhibit of the Public Health Service at the Panama-Pacific International Exposition will be more extensive than any previous effort on the part of the bureau. Five thousand square feet of floor space in the Palace of Liberal Arts has been assigned for this exhibit, which will consist of the following main features:

A model working board of health laboratory, equipped for water analysis in addition to the usual board of health work; a model health officer's library; models, electrically operated, showing the death rates of the principal communicable diseases and other sanitary data; models and charts showing distribution, method of spread, and manner of controlling and preventing such diseases as typhoid fever, malaria, plague, hookworm, smallpox, and trachoma.

Mosquito-eradication methods, actual breeding of mosquitoes, and models of different varieties of mosquitoes, with their eggs and larval form, will also be shown.

There will be models of the tick which transmits Rocky Mountain spotted fever, of the house fly, of the bubonic-plague flea, and other insect transmitters of disease.

Control of rabies, diphtheria, and the communicable diseases of children will be presented in a graphic manner.

Transparencies of many intestinal parasites and pathogenic organisms will also be included.

All of the material for the exhibit will be of such a character that it may subsequently be used as the nucleus for the formation of a museum of hygiene in the city of Washington.

At the request of the director of exhibits an officer has been detailed as superintendent of hygiene and sanitation exhibits in addition to his other service duties.

Surg. C. C. Pierce, temporarily stationed at the bureau, is engaged in preparing the service exhibit for the exposition.

SANITARY REPORTS AND STATISTICS.

SUMMARY OF ACTIVITIES.

The activities of the Division of Sanitary Reports and Statistics may be roughly classified under three heads: (1) The securing and publishing in suitable form of information necessary for health officers and health workers which can not properly or effectually be collected by them and without which rational health administration is impossible. (2) The issuing of educational pamphlets for general use in the form of supplements to the Public Health Reports. (3) The publication in the Public Health Reports of information relating to health matters with the special object of keeping the health officers of the country informed regarding new discoveries in the control and prevention of disease.

Special attention has been given during the year to ascertaining the prevalence and geographic distribution of dangerous communicable diseases in the United States. No health department, Federal, State, or local, can effectively prevent or control a disease without knowledge of when, where, and under what conditions the disease is occurring. Although the control of disease depends essentially upon the possession of this information, this is a part of public health work which has been neglected in all parts of the United States. Progress in public health work depends upon the repairing of this defect and the establishment of a dependable system whereby health departments, local, State, and Federal, may keep currently informed of the prevalence and geographic distribution of controllable diseases within their respective spheres of activity.

With this in mind, the State and Territorial health authorities in conference with the Public Health Service at Minneapolis in 1913 approved a model State law, which, if enacted and enforced, will supply the information regarding the occurrence of disease above referred to. Special effort has been made during the year to familiarize those interested in public health work with the admirable provisions of this law, and to gain their support in urging its enactment by the several States.

In the collection of information of the occurrence of communicable diseases and of the prevalence of those dangerous to the public health the Federal Government has until recently done little better than the State and local authorities, with the result that there is as yet an all too limited provision for the work. This, however, is being remedied as rapidly as additional competent help can be secured.

While the Treasury Department is intrusted with the responsibility of preventing the interstate spread of diseases dangerous to the public health, this work depends largely upon the extent and manner of the intrastate control of communicable diseases by the respective State and local health authorities. Information has been secured of these intrastate activities largely through a study of the enactment of laws and the promulgation of regulations on sanitary matters and matters pertaining to the public health in States and lesser political subdivisions. Through the study of current sanitary legislation, not only have the activities of intrastate authorities been watched, but it has been possible to render much valuable assistance in the drafting of effective legislative measures for localities, to encourage the copying of the more effectual laws and regulations, and to increase the tendency toward uniformity in these matters. As far as possible, a careful study has also been made of currently enacted sanitary legislation, not only for the purpose of knowing the nature of the laws being enacted, but that assistance and advice might be given which would make more effectual and more economical both intrastate and interstate control of disease.

As a result of this work there has been a growing demand on the part of State and local authorities for drafts of sanitary legislation which will best serve the interests of their respective localities. This demand has been growing so rapidly that it is much in excess of the facilities at present available for this class of work.

The Public Health Reports have been issued throughout the year, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912. Through their pages Federal, State, and local health authorities have been kept currently informed, to the extent that the information was available, of the prevalence and geographic distribution of the dangerous communicable diseases. This has served to give timely warning of the approach of epidemics and the need and nature of sanitary measures required for the protection of the respective localities. Through this publication, also, these health authorities have been kept informed of the sanitary laws and regulations being enacted by States and municipalities throughout the country. The field of sanitary legislative activities has thus been spread before each individual health officer, and it has been possible for him to discard the chaff and select the best for adoption in his own jurisdiction.

Information in regard to sanitary matters and the prevention of disease in households and communities has been furnished to the public through supplements to the Public Health Reports, which are issued in the form of small pamphlets.

Public Health Reports.

The Public Health Reports have been issued weekly, pursuant to the requirements of law. They are now issued in editions of approximately 11,000. Owing to the fact that it is practically impossible for a local or State health officer to efficiently perform his duties without the information contained in this publication, the demand for it has increased, and it is now in constant use by practically every health officer in the country.

The matters published are divided into five departments, giving: (1) The current prevalence and geographic distribution of the preventable and controllable diseases in the United States. (2) Sanitary legislation showing State laws and regulations, city ordinances and regulations, and court decisions on matters pertaining to the public health. (3) The prevalence and geographic distribution in foreign countries of the diseases made quarantinable by the United States quarantine act of 1893. (This information is necessary for the maintenance of a rational and effective maritime quarantine. Without it commerce would either be unduly interfered with or the efforts at the prevention of the introduction of disease would be futile.) (4) Matters of interest to health officers, largely educational in nature, intended to keep health officers informed of current matters and discoveries relating to their work. (5) The supplements, which are issued as pamphlets, relating to personal and community hygiene, educational in character, and intended for general distribution and use.

Educational Supplements.

The supplements consist mainly of short articles on matters of personal and public hygiene, largely educational in nature, and for general distribution. During the fiscal year 1914, 10 supplements were published. Their titles are given under the chapter "Publications" in this report.

Reprints.

The articles which appear in the Public Health Reports, and for which there will be an additional demand, are reprinted in pamphlet form. The articles are thus available for further distribution and use. Many of these reprints are highly educational in nature and have had a broad distribution. During the fiscal year 1914, 69 reprints have been issued. They cover various subjects intimately related to public-health work, and are listed by titles in this report under the heading "Publications."

Sanitary Legislation.

Up to the time of the publication currently in the Public Health Reports of State and municipal laws and regulations pertaining to the public health, State and city authorities had no means of keeping informed regarding the action being taken and the measures inaugurated by others. The task of keeping in touch with the various States and the hundreds of cities was greater than the facilities at the disposal of any of the local authorities would warrant. Nevertheless it may be accepted as highly desirable and practical that each should know the trend and progress of sanitary legislation and practices that each may benefit by the progress in health administration and its adaptation to the control of sanitary conditions as worked out by others. It is a waste of time, energy, and resources to needlessly and laboriously work out conditions or requirements which have already been worked out by others. To benefit by the ideas and work of others is common sense in health matters as well as in commerce. For this purpose the publication currently in the Public Health Reports of the laws, ordinances, and regulations being enacted and promulgated was begun. The results have shown the wisdom of the inauguration of this work. Every health officer now has the means readily at hand of knowing all the sanitary practices and methods being adopted by his hundreds of confreres in other jurisdictions. Health officers are now far more familiar than formerly with health legislation, its needs and difficulties, and the relative merits of different measures. There is a tendency toward the general adoption of the better laws; the good are surviving; the defective and hastily prepared are being discarded.

STATE HEALTH LAWS AND REGULATIONS.

The publication of State laws was begun with those enacted since July 1, 1911. They have appeared currently in the Public Health Reports as soon after their enactment as it was possible to obtain satisfactory copies. The laws and regulations for the period July 1, 1911, to December 31, 1912, have been compiled and classified under subjects so that they will form a permanent record of State sanitary legislation for that period. Laws enacted and regulations promulgated during the calendar year 1913 have also been similarly compiled.

MUNICIPAL HEALTH LAWS AND REGULATIONS.

What the State laws are to the State health administration, municipal ordinances and regulations are to city health departments. The facilities of the cities are less than those of the State authorities and their number is far greater. It is quite impossible for each city to keep in touch with the legislation of the hundreds of others, and the need for this being done by some agency acting as a clearing house for all is evident. City ordinances and regulations have been published for the period from January 1, 1910, to date. For a permanent record of municipal sanitary legislation they have been compiled. The first compilation issued covers the period from January 1, 1910, to June 30, 1911; the second, the period from July 1 to December 31, 1911; the third, for the calendar year 1912; and the fourth, the calendar year 1913. By making accessible to all each and every legislative act of a sanitary nature, the good will survive and the poor gradually disappear. Examples of good laws are within the reach of all, and the author of a measure knows that it will soon be the subject of criticism by all engaged in health administration.

COURT DECISIONS.

To properly appreciate and understand the significance of laws and regulations it is necessary that the construction placed upon them by courts of last resort, as shown in their decisions, be similarly accessible. It, therefore, was found desirable to publish currently court decisions relating to sanitary legislation. The systematic publication of these decisions was begun during the current fiscal year.

MODEL LAWS.

One of the results of the publication of sanitary legislation, and one which logically might have been foreseen, is the demand by States and municipalities for model laws, ordinances, and regulations on various sanitary subjects. With the constant change going on in the personnel of local health departments many incumbents do not remain in office a sufficient length of time to become versed in and experts at the drafting of laws or ordinances. Owing to this condition and to other causes there is a constant demand for model laws on all the various matters covered by legislation and for model regulations to cover the matters usually included in regulations. With the exception of the model law for morbidity reports adopted by the conference of State and Territorial health authorities with the United States Public Health Service, up to the present time no models have been published, although advice and suggestions regarding the drafting of laws and ordinances is a matter of daily correspondence. With the increasing demand for such models their preparation will be necessary.

THE MODEL STATE LAW FOR MORBIDITY REPORTS.

The model State law for morbidity reports adopted by the twelfth annual conference of State and Territorial health authorities with the Federal Public Health Service in 1913 has been adopted to a greater or less extent in a number of States. In some instances almost the entire law has been adopted, in others only a part. The States adopting the law and the manner and extent of the adoption are as follows:

KANSAS.

December 13, 1913, the Kansas State Board of Health adopted and promulgated as regulations sections 2 to 10, inclusive, of the model State law for morbidity reports. The regulations have the force of law, authority for their promulgation and enforcement being given by section 8030 of the Kansas General Statutes, 1909.

In the regulations as promulgated sections 2 to 10 of the model law have been numbered sections 1 to 9. The only amendment made to section 2 of the law was the omission of "continued fever lasting seven days" from the notifiable diseases. Section 3 of the model law was amended by making a statement of the patient's nativity one of the items to be included in the physician's report, and by requiring the reports of cases of venereal diseases to be made direct to the State board of health instead of to the local health officer.

The regulations have been in operation now for over six months; and if they are complied with by the practicing physicians or enforced by the State board of health, the State of Kansas should be in possession of more detailed and accurate information of the current occurrence of controllable diseases and of their prevalence and geographic distribution within its jurisdiction than any other State. As the control of these diseases naturally depends upon a knowledge of the conditions under which cases are occurring and their prevalence and geographic distribution, the State board of health should also be in an unusually strong position as regards their control. It may be too soon for the new regulations to be working smoothly and satisfactorily. However, it should be only a few months until this is accomplished.

FLORIDA.

April 3, 1914, Dr. Joseph Y. Porter, secretary of the State Board of Health of Florida, reported that on March 5, 1914, that board had adopted the model State law for morbidity reports. The law was adopted as a regulation to supersede rule 1 of the rules and regulations of the State board of health. The promulgation of such regulations being authorized by law, the regulations themselves have the force of law.

ARKANSAS.

In Arkansas many of the counties are using the model notification blank prescribed by the model law.

LOUISIANA.

In Louisiana the model notification blank is being used throughout the State, and the physicians are reporting upon it direct to the collaborating epidemiologist.

OTHER STATES.

In Mississippi and in South Carolina a number of the provisions of the model law have been adopted as regulations.

AMERICAN PUBLIC HEALTH ASSOCIATION.

At its annual meeting in the autumn of 1913 at Colorado Springs the American Public Health Association appointed a committee to take up the matter of the indorsement of the model law with other interested associations. It is the purpose of this committee to take up the matter with such organizations as the American Bar Association, the American Association for Labor Legislation, American Association for the Study and Prevention of Infant Mortality, American Association for the Study and Prevention of Tuberculosis, and perhaps others.

Prevalence and Geographical Distribution of Controllable Diseases in the United States.

There can be no rational or effectual control of disease in the absence of information regarding the occurrence of cases and their geographic distribution. Information of when, where, and under what conditions cases of a disease are occurring gives the health officer a knowledge of the enemy which enables him to carry out a definite campaign and wage a hopeful war. Without this information he is working more or less blindly, and most of his efforts will be wasted. Economy and efficiency in health administration are inseparable from complete knowledge of the occurrence and relative prevalence of controllable diseases.

COLLABORATING EPIDEMIOLOGISTS.

To secure prompt and complete reports of the occurrence of diseases dangerous to the public health it has been found desirable in a number of States to procure the services of competent persons for the purpose. To meet this need collaborating epidemiologists have been appointed in the States of Arkansas, Louisiana, Mississippi, Ohio, and South Carolina. The duties of these officers are: (1) To report by telegraph whenever, within the State for which they are appointed, there is an unusual outbreak or a sudden increase in the number of cases of any of the following diseases: Smallpox, typhoid fever, scarlet fever, poliomyelitis (infantile paralysis), diphtheria, and epidemic cerebrospinal meningitis. (2) To report by telegraph whenever cases of the following diseases occur within the State: Cholera, typhus fever, yellow fever, plague, Rocky Mountain spotted (or tick) fever. (3) To make monthly reports by the 20th of each month of the number of cases of the notifiable diseases reported in the State during the preceding calendar month. This last information will usually be taken from the records of the State department of health.

REPORTS BY OTHER OFFICERS.

Supplementing the collaborating epidemiologists are the other officers of the service, each of whom is required to make reports for the locality in which he may be stationed.

REPORTS BY STATE HEALTH OFFICERS.

Aside from those States in which collaborating epidemiologists have been appointed, regular monthly reports of the cases of notifiable diseases reported to them are forwarded by the following States: California, District of Columbia, Hawaii, Idaho, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Dakota, Ohio, Oregon, South Carolina, Texas, Vermont, Virginia, Washington, and Wisconsin.

In addition to this, the State Department of Health of Maryland has cooperated by keeping the bureau informed by telegraph of outbreaks of smallpox within the State.

RECIPROCAL NOTIFICATION BY STATES.

Whenever there occurs in the State of Minnesota a case of a communicable disease, dangerous to the public health, in a person who has recently arrived from some other State and probably obtained his infection in that other State, the Minnesota State Board of Health sends a notice to the health department of the locality from which the patient has come, giving the essential facts in the case.

This is an example of cooperation which is logical and useful. It shows that the Minnesota State Board of Health looks at the control of disease from a rational viewpoint, and that it acts sincerely in performing its duties and in extending necessary cooperation to other health authorities.

During the first six months of the calendar year 1914 reciprocal notifications of the occurrence of cases were given by the State Department of Health of Minnesota to health authorities of other States, as follows:

RECIPROCAL NOTIFICATION IN MINNESOTA.

JANUARY.

Disease.	Notified at—	Referred to health authority of—	Why referred.
Smallpox	St. Paul, Ramsey County.	Havre, Hill County, Mont.	Taken ill en route from Havre.
Typhoid fever	Rochester, Olmsted County.	Flaxcombe, Saskatchewan	Infected in harvest at Flaxcombe.
	Glencoe, McLeod County.	American Falls, Power County, Idaho.	Infected in harvest at American Falls.
	South St. Paul, Dakota County.	Gary, Lake County, Ind	Infected in Gary.
	Minneapolis, Hennepin County.	Outlook, Sheridan County, Mont.	Infected at railroad camp at Outlook.
	do	Plentywood, Sheridan County, Mont.	Infected at railroad camp at Plentywood.
	do	Ambrose, Divide County, N. Dak.	Infected on railroad work at Ambrose.
	do	Hankinson, Richwood County, N. Dak.	Taken ill at Hankinson.
	Benson, Swift County.	Rugby, Pierce County, and Leeds, Benson County, N. Dak.	Visited in Rugby and Leeds twenty-fourth to sixteenth day before first symptoms.
	Rochester, Olmsted County.	Balfour, McHenry County, N. Dak.	Infected at home in Balfour.
Scarlet fever	St. Paul, Ramsey County.	Osceola, Polk County, Wis.	Taken home to Osceola.
Tuberculosis	Minneapolis, Hennepin County.	Wilcox, Saskatchewan	A resident of Wilcox.

FEBRUARY.

Disease.	Notified at—	Referred to health authority of—	Why referred.
Smallpox	Vernon Center, Blue Earth County.	Omaha, Douglas County, Nebr.	Infected by roommate at Omaha.
	Rochester, Olmsted County.	Ackworth, Rolette County, N. Dak.	Infected at Ackworth.
Typhoid fever	Rochester, Olmsted County.	Elk Point, Union County, S. Dak.	Infected at Elk Point.
	Duluth, St. Louis County.	Ashland, Ashland County, Wis.	Infected while working on scow at Ashland.
Tuberculosis	Rochester, Olmsted County.	Loyal, Clark County, Wis.	Resident of Loyal.
	St. Paul, Ramsey County.	Maunie, White County, Ill.	Left Minnesota for Maunie.
	Rochester, Olmsted County.	Hampton, Franklin County, Iowa.	Resident of Hampton.
	Pokegama Sanatorium, Pokegama, Pine County.	Somerset, St. Croix County, Wis.	Left for home; Somerset.
	Rochester, Olmsted County.	Forsyth, Rosebud County, Mont.	Resident of Forsyth.

MARCH.

Disease.	Notified at—	Referred to health authority of—	Why referred.
Scarlet fever	Seeley Township, Faribault County.	Kanawha, Hancock County, Iowa.	Resident of Kanawha, Iowa.
	Austin, Mower County.	Chamberlain, Brule County, S. Dak.	Resident of Chamberlin, S. Dak.
Smallpox	St. Paul, Ramsey County.	Aberdeen, Brown County, S. Dak.	Came from Aberdeen, S. Dak.
	Minneapolis, Hennepin County.	Valley Junction, Polk County, Iowa.	Probably infected at Valley Junction, Iowa.
Tuberculosis	Pokegama Sanatorium, Pokegama, Pine County.	Chicago, Cook County, Ill.	Resident of Chicago, Ill.
		Pierpont, Day County, S. Dak.	Resident of Pierpont, S. Dak.
		Excelsior, Richland County, Wis.	Resident of Excelsior, Wis.
		Alcester, Union County, S. Dak.	Returning to Alcester, S. Dak.
		Ambrose, Divide County, N. Dak.	Returning to Ambrose, N. Dak.

RECIPROCAL NOTIFICATION IN MINNESOTA—continued.

Disease.	Notified at—	Referred to health authority of—	Why referred.
		APRIL.	
Measles	Rochester, Olmsted County.	Dalhart, Dallam County, Tex.	Left Rochester without health officer's permission.
Scarlet fever	do	Canton Township, Buffalo County, Wis.	Broke quarantine and went to Canton Township, Wis.
Do	Litchfield, Meeker County.	North Dakota	Came from district about 14 miles from Mandan, Norton County, N. Dak.
Smallpox	Rochester, Olmsted County.	Scotland, Bonhomme County, S. Dak.	Broke quarantine and went to Scotland, S. Dak.
Do	Goodhue, Goodhue County.	Ellsworth, Pierce County, Wis.	Evidently infected at Ellsworth, Wis.
Do	Minneapolis, Hennepin County.	Des Moines, Polk County, Iowa	Evidently infected at Des Moines, Iowa.
Typhoid fever	Granite Falls, Chippewa County.	Minot, Ward County, N. Dak.	Visited in Minot during three weeks prior to date of first symptoms.
Tuberculosis	Pokegama Sanatorium, Pokegama, Pine County.	Baker, Benson County, N. Dak.	Returned home; Baker, N. Dak.
Do	do	Hudson, St. Croix County, Wis.	Returned home; Hudson, Wis.
Do	St. Paul, Ramsey County.	Baden, Ward County, N. Dak.	Left St. Paul for Baden.
		MAY.	
Tuberculosis	Pokegama Sanatorium, Pokegama, Pine County.	Forman, Sargent County, N. Dak.	Returned home; Forman, N. Dak.
	Do	Wolford, Pierce County, N. Dak.	Returned home; Wolford, N. Dak.
	Do	Excelsior, Richland County, Wis.	Returned home; Excelsior, Wis.
	Do	Hudson, St. Croix County, Wis.	Returned home; Hudson, Wis.
	Do	Danville, Hendricks County, Ind.	Returned home; Danville, Ind.
	Do	Pierpont, Day County, S. Dak.	Returned home; Pierpont, S. Dak.
	Do	White, Brookings County, S. Dak.	Returned home; White, S. Dak.
	Do	Chicago, Cook County, Ill.	Returned home; Chicago, Ill.
	St. Paul, Ramsey County.	Dayton, Montgomery County, Ohio.	Returned home; Dayton, Ohio.
		JUNE.	
Smallpox	Minneapolis, Hennepin County.	Aberdeen, Brown County, S. Dak.	Disease contracted at Aberdeen, S. Dak.
	Do	Waterloo, Black Hawk County, Iowa	At Waterloo Hotel, 10–12 days before first symptoms.
	Do	Fargo, Cass County, N. Dak.	Came from Fargo to Minneapolis, Minn.
	Columbia Heights, Anoka County.	Grand Haven, Ottawa County, Mich.	Went to home in Grand Haven, Mich.
Typhoid fever	Fergus Falls, Otter Tail County.	Minot, Ward County, N. Dak.	Went to Minot; infected in Minnesota.
	Byron, Olmsted County.	Manly, Worth County, Iowa	Fireman; headquarters, Manly, Iowa.
Tuberculosis	Mankato, Blue Earth County.	Akron, Summit County, Ohio	Went to home in Akron, Ohio.
	Do	Bozeman, Gallatin County, Mont.	Resident of Bozeman, Mont.
	Do	Rolla, Phelps County, Mo.	Nursed tuberculosis case at Rolla; returned to Mankato; "open" case.
	Do	do	Do.
	Minneapolis, Hennepin County.	De Beque, Mesa County, Colo.	Went to De Beque, Colo.
	Do	Pekin, Nelson County, N. Dak.	Resident of Pekin, N. Dak.
	Do	Lankin, Walsh County, N. Dak.	Died at Thomas Hospital, Minneapolis.
	Do	Fargo, Cass County, N. Dak.	Resident of Fargo, N. Dak.
	Do	Northwood, Grand Forks County, N. Dak.	Resident of Northwood, N. Dak.
	Do	Mellen, Ashland County, Wis.	Moved to Mellen, Wis.

RECIPROCAL NOTIFICATION IN MINNESOTA—continued.

JUNE—continued.

Disease.	Notified at—	Referred to health authority of—	Why referred.
Tuberculosis	Minneapolis, Hennepin County.	Cushing, Polk County, Wis.	Resident of Cushing, Wis.
	Do	Strum, Trempealeau County, Wis.	Returned to Strum, Wis.
	Do	Ellsworth, Pierce County, Wis.	Temporary resident of Ellsworth.
	Do	Trade Lake, Burnett County, Wis.	Died at Thomas Hospital, Minneapolis.
	Do	Wallace, Coddington County, S. Dak.	Resident of Wallace, S. Dak.
	Rochester, Olmsted County.	Story City, Story County, Iowa	Returned to home at Story City, Iowa.
	Do	Surrey, Ward County, N. Dak.	Returned to home at Surrey, N. Dak.
	St. Paul, Ramsey County.	Little Rock, Pulaski County, Ark.	Went to home at Little Rock, Ark.
	Do	Menomonie, Dunn County, Wis.	Went to Menomonie, Wis.

REPORTS BY CITY HEALTH OFFICERS.

Most of the cities of over 10,000 population which have active and efficient health departments report weekly on forms furnished them for the purpose. These reports give the number of cases of diseases dangerous to the public health notified in their respective cities during the week ending Saturday night. These reports are mailed on Monday.

Information contained in these reports is published in the Public Health Reports, and gives a fairly current account of the prevalence of communicable diseases in the more progressive cities. Unfortunately, these diseases are likely to be more prevalent in the cities that do not have efficient health departments. In such cities, however, there is likely to be no law requiring the notification of disease; or if there be a law, it is usually not enforced, and records of the prevalence of disease are therefore absent.

BERIBERI.

Beriberi is not infrequently reported in jails, asylums, and other institutions in the United States. The disease is without doubt far more prevalent than the reported cases would seem to indicate. There can be no question that it is frequently not recognized, and that cases and deaths which occur are assigned to some other cause. The disease has frequently been recorded in the State asylums in Texas and in asylums in Arkansas. It has been reported in New England and in jails in New Jersey, in various localities in California, and elsewhere.

It is now accepted that beriberi is caused by the continued use of an unbalanced ration; that the most common type of ration which produces it is one consisting largely of polished rice. Because the disease is not only preventable but is readily curable, it is essential that from the standpoint of the welfare of the community health departments, by supervision over the rations in use in the various institutions within their respective jurisdictions, should prevent its occurrence, particular attention being given to asylums, jails, and penitentiaries in which inmates are kept for periods longer than three months.

DENGUE.

In October, 1913, dengue was widely prevalent in the city of Savannah, Ga. The disease was epidemic and swept through the population. It is communicable, but is seldom, if ever, fatal. No accurate information of the number of cases of the disease that occurred or other details regarding the epidemic are available.

DIPHTHERIA.

Diphtheria is a disease which is generally prevalent throughout the country. It is more common at certain seasons than at others. It is one of special interest because of the frequency of so-called diphtheria carriers, persons who carry the organism which causes the disease but do not themselves have the disease in clinical form. Diphtheria is also particularly interesting, inasmuch as it is one of the very few diseases for which we have a specific treatment. The cases reported by States are given in the following table:

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama[1]	2,238,614	31	9	28	3	34	5	13	4
Arizona	230,808	1	....	3	....	3	....	2	1
California	2,667,516	154	12	71	7	154	17	107	22
Connecticut	1,181,793	303	20	219	23	158	14	188	21
District of Columbia	348,077	56	3	31	4	35	1	30	4
Hawaii	191,909	21	1	6	2	9	....	4	1
Idaho	378,818	2	....	6	2	1	1	3	....
Illinois	5,904,043	1,623	172	1,220	125	1,061	124	873	115
Indiana	2,760,792	428	66	332	48	189	24	147	23
Iowa	2,222,472	117	32	97	18	74	11	109	12
Kansas	1,762,573	71	6	59	4	55	4	39	5
Maryland[2]	1,330,209	88	11	73	10	71	6	42	5
Massachusetts	3,548,705	605	....	562	....	592	....	565	....
Michigan	2,936,618	428	59	332	50	368	55	345	55
Minnesota	2,181,077	222	18	223	14	211	23	240	32
Montana	419,174	14	2	13	1	12	1	15	....
Nebraska	1,233,122	....	17	....	11	....	12	....	7
Nevada	94,722	....	....	1	....	....	....	4	....
New Jersey	2,749,486	593	44	429	44	450	64	449	41
New York	9,712,954	2,191	163	1,907	206	1,909	210	1,879	201
Oklahoma	1,938,761	88	14	71	10	55	7	31	3
Oregon	756,988	72	3	19	2	24	3	25	3
South Carolina	1,572,285	54	....	70	....	49	....	72	....
South Dakota[1]	643,121	58	1	14	....	42	3	22	1
Utah	404,735	19	2	20	2	11	....	29	3
Virginia	2,129,003	203	....	114	....	92	....	70	....
Washington	1,344,686	73	7	60	5	69	2	79	4
Wisconsin	2,419,898	243	31	181	18	151	22	192	21
Wyoming[1]	163,325	....	2	9	1	2	3	7	2

[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available—Continued.

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama [1]	21	3	12	2	9	....	54	17	103	17
Arizona	1	....	....	....	....	....	....	....	....	....
California	112	15	110	15	99	5	102	6	118	17
Connecticut	201	23	156	10	139	13	107	10	166	20
District of Columbia	67	1	37	1	19	1	15	....	25	1
Hawaii	8	1	3	....	10	3	14	3	10	2
Idaho	....	....	5	1	4	....	4	....	1	....
Illinois	942	118	918	97	649	74	476	57	767	69
Indiana	145	30	129	21	126	20	195	36	397	45
Iowa	61	9	36	5	26	7	27	8	43	7
Kansas	55	4	24	....	14	1	53	2	50	2
Maryland [2]	38	3	32	4	37	4	47	10	69	7
Massachusetts	585	....	487	....	407	....	322	....	445	....
Michigan	342	44	285	47	259	52	271	3	417	57
Minnesota	265	17	200	12	141	11	149	8	187	8
Montana	4	1	9	1	9	3	19	2	9	3
Nebraska	....	6	....	3	....	2	....	1	....	1
Nevada	2	....	....	....	4	1	....	....	1	....
New Jersey	576	46	433	38	297	25	327	35	431	47
New York	1,865	168	1,660	155	1,287	113	986	101	1,131	87
Oklahoma	23	5	15	6	27	4	45	6	65	19
Oregon	26	2	21	2	20	2	23	4	17	1
South Carolina	41	....	46	....	36	....	171	....	242	....
South Dakota [1]	43	3	14	1	26	....	7	....	23	5
Utah	12	3	11	....	16	3	14	1	21	3
Virginia	47	....	66	....	79	....	302	....	429	....
Washington	66	2	45	2	34	4	28	1	37	3
Wisconsin	140	27	146	17	137	24	160	16	115	21
Wyoming [1]	1	....	....	....	7	....	2	....	12	....

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Alabama [1]	101	39	60	35	44	11	510	145	0.228	28.43
Arizona	....	....	....	....	....	....	[3] 10	[3] 1	.172	10.00
California	199	19	245	23	188	26	1,659	184	.622	11.09
Connecticut	264	21	391	27	362	21	2,654	220	2.246	8.29
District of Columbia	78	6	82	1	55	3	530	26	1.523	4.91
Hawaii	6	....	8	1	20	1	119	15	.620	12.60
Idaho	....	....	2	....	1	....	28	4	.074	14.29
Illinois	1,325	99	1,378	125	1,318	121	12,550	1,296	2.126	10.33
Indiana	727	61	775	72	487	50	4,077	496	1.477	12.17
Iowa	83	14	104	10	88	28	865	161	.389	18.61
Kansas	83	6	112	6	112	6	727	46	.412	6.33
Maryland [2]	192	16	204	24	155	15	1,048	115	.788	10.97
Massachusetts	462	....	706	....	817	....	6,735	(4)	1.898	....
Michigan	618	72	841	67	906	57	5,412	652	1.843	12.05
Minnesota	354	17	483	21	398	28	3,073	209	1.409	6.80
Montana	5	....	16	1	13	2	138	17	.329	12.32
Nebraska	....	11	....	9	....	....	....	80	....	....
Nevada	....	....	....	....	....	....	12	1	.127	8.33
New Jersey	703	46	721	63	673	66	6,082	559	2.212	9.19
New York	1,631	106	1,338	135	2,360	162	20,114	1,807	2.071	8.98
Oklahoma	145	28	139	13	105	33	809	148	.417	18.29
Oregon	18	....	21	2	36	4	322	28	.425	8.70
South Carolina	460	....	329	....	433	....	2,003	....	1.274	....
South Dakota [1]	16	....	48	4	27	2	340	20	.529	5.88
Utah	24	5	21	3	28	4	226	29	.558	12.83
Virginia	700	....	613	....	354	....	3,609	(4)	1.695	....
Washington	25	1	40	5	39	8	595	44	.442	7.39
Wisconsin	277	20	268	36	277	33	2,287	286	.945	12.51
Wyoming [1]	7	....	2	....	1	....	50	8	.306	16.00

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[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.
[3] For six months only.
[4] Deaths were not reported.

EPIDEMIC CEREBROSPINAL MENINGITIS.

Epidemic cerebrospinal meningitis was reported present in 23 States and the Territory of Hawaii. It was probably present in a number of other States, but not reported. In no State was a very great number of cases reported.

In Wisconsin there were 411 cases reported, in New York 333, in Massachusetts 178, in Illinois 177, and in Alabama 171. The number of cases reported in the States making reports is shown in the following table:

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama[1]	2,238,614	26	13	32	12	17	17	39	22
Arizona	230,808	5	1	9	10	18	20	14	5
California	2,667,516	7	2	4	4	18	6	8	5
Connecticut	1,181,793	5	2	4	4	5	2	......	2
District of Columbia	348,077	......	......	1	1	......	......	......	......
Hawaii	191,909	1	......	1	......	......	......	......	3
Illinois	5,904,043	32	4	8	7	23	13	18	15
Indiana	2,760,792	......	1	......	......	......	4	......	1
Iowa[1]	2,222,472	10	8	6	8	6	6	8	10
Kansas	1,762,573	8	2	4	2	3	2	7	1
Maryland[2]	1,330,209	......	3	1	9	1	10	......	6
Massachusetts	3,548,705	14	......	15	......	25	......	16	......
Minnesota[1]	2,181,077	......	......	3	......	1	1	4	2
Montana[1]	419,174	......	12	......	8	......	15	3	11
Nebraska	1,233,122	......	10	......	5	......	3	......	12
Nevada	94,722	3	3	2	1	1	1	......	......
New York	9,712,954	29	32	25	20	32	31	25	31
Oklahoma	1,938,761	......	2	......	18	......	9	......	11
South Carolina	1,572,285	......	......	......	......	1	......	7	......
South Dakota	643,121	......	......	......	......	......	......	......	......
Utah	404,735	......	......	......	3	......	5	......	6
Washington[1]	1,344,686	1	3	......	5	1	4	1	6
Wisconsin	2,419,898	10	45	9	37	14	37	13	44
Wyoming	163,325	......	......	......	1	......	2	......	1

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama[1]	27	23	14	10	3	6	2	2	4	2
Arizona	5	2	3	4	......	......	......	......	......	......
California	6	2	2	6	3	3	3	5	......	3
Connecticut	2	1	3	2	1	2	3	3	2	2
District of Columbia	1	1	......	......	1	1	......	......	1	......
Hawaii	......	......	2	1	......	......	......	......	1	1
Illinois	13	16	9	10	8	8	9	3	21	11
Indiana	......	4	......	......	......	......	......	4	......	3
Iowa[1]	3	4	3	5	2	......	3	4	......	2
Kansas	4	1	2	......	1	......	1	......	1	......
Maryland[2]	2	8	......	11	2	7	1	7	......	8
Massachusetts	18	......	13	......	6	......	14	......	14	......
Minnesota[1]	2	1	......	......	1	3	4	......	1	1
Montana[1]	2	6	5	7	2	7	2	4	1	2
Nebraska	......	1	......	8	......	7	......	11	......	9
Nevada	1	1	......	......	1	1	......	......	......	......
New York	26	23	25	25	25	16	26	27	45	33
Oklahoma	......	5	......	2	......	6	......	9	......	3
South Carolina	2	......	14	......	1	......	4	......	1	......
South Dakota	3	2	......	......	......	......	......	......	3	......
Utah	......	12	......	6	......	......	......	2	......	2
Washington[1]	......	......	1	2	......	1	......	4	3	......
Wisconsin	2	53	16	32	6	31	8	23	3	34
Wyoming	......	......	......	2	......	......	......	1	......	......

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[1] The health officer states that cases are known not to be completely reported.

[2] Exclusive of the city of Baltimore.

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available—Continued.

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rates per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Alabama[1]	3	......	3	2	......	1	171	110	0.076	64.33
Arizona	......	......	......	......	......	......	[3] 54	[3] 42	.468	77.78
California	7	8	4	4	5	1	67	49	.025	73.13
Connecticut	1	......	1	2	4	1	31	23	.026	74.19
District of Columbia	......	......	......	......	......	......	4	3	.11	75.00
Hawaii	1	1	......	......	......	......	6	6	.031	100.00
Illinois	12	9	13	6	11	9	177	111	.030	62.71
Indiana	......	1	......	2	......	......	20	50	......	......
Iowa[1]	7	1	2	4	......	2	50	54	......	......
Kansas	2	......	1	......	2	......	36	8	.020	22.22
Maryland[2]	2	6	......	7	2	4	11	86	......	......
Massachusetts	11	......	14	......	18	......	178	(4)	.050	......
Minnesota[1]	......	......	1	1	1	2	18	11	.008	61.11
Montana[1]	......	5	1	6	......	5	16	88	......	......
Nebraska	......	10	......	10	......	......	......	86	......	......
Nevada	1	1	1	1	1	1	11	10	.116	90.91
New York	36	18	19	29	20	22	333	307	.034	92.19
Oklahoma	......	6	......	17	......	2	......	90	......	......
South Carolina	1	......	......	......	1	......	32	......	.020	......
South Dakota	......	......	......	......	2	1	8	3	.012	37.50
Utah	......	1	......	1	......	......	......	38	......	......
Washington[1]	3	5	1	3	1	2	12	35	......	......
Wisconsin	6	22	8	26	13	27	108	411	......	......
Wyoming	......	1	......	......	8	3	8	11	......	......

[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.
[3] For the first 6 months only.
[4] Deaths were not reported.

LEPROSY.

Cases of leprosy continue to be reported from various localities of the country. This has been the experience for several years. In most instances the patients are quarantined and to some extent isolated. In other instances they are given various degrees of freedom and in some localities no attention whatsoever is paid to them. Institutions for the care of these unfortunates are maintained in the States of California, Massachusetts, and Louisiana. The following table shows the cases of leprosy reported during the year in various localities:

Cases of leprosy reported.

State.	Place.	Date.	Number.
California	Los Angeles	Oct. 11, 1913	1
		Nov. 8, 1913	1
		Nov. 19, 1913	2
		Apr. 14, 1914	1
		May 2, 1914	2
	Oakland	Mar. 28, 1914	1
	San Bernardino	July —, 1913	1
District of Columbia	Washington	June —, 1914	1
Louisiana	New Orleans	Dec. 13, 1913	2
Massachusetts	Boston	Nov. 7, 1913	1
Michigan	Benton Harbor	Dec. —, 1913	1
	Detroit	June 4, 1914	1
Missouri	St. Louis	Aug. 6, 1913	1
New York	Clymer	Mar. —, 1914	1
	New York City	do.	1
Ohio	Cleveland	July 8, 1914	1
South Carolina	Georgetown	July 1, 1914	1
	Pickens County	Oct. —, 1913	1
Washington	Winlock	Mar. 13, 1914	1
Wisconsin	Milwaukee	May —, 1914	1

MALARIA.

Malaria is of especial interest from a public health standpoint, and it is one of the most controllable of the controllable diseases. No State or county need have malaria unless it wishes to have it. There are, however, frequently difficulties in the way of controlling the disease, as for instance when in a sparsely settled locality with a relatively small population there are many swamps and marshes and other collections of stagnant or slow-flowing water, in which the anopheline mosquitoes which spread the disease can breed. Under such circumstances the magnitude of the engineering projects necessary to substitute effective artificial drainage for defective natural drainage and to get rid of the mosquito-breeding water deposits is so great that it can not be handled by a numerically small community.

However, even under these circumstances, the disease is controllable, in that with the use of quinine we have what almost amounts to a specific. The proper taking of daily or weekly doses of quinine will prove effective in controlling the disease.

The prevalence of the disease, therefore, and its geographic distribution in the United States are of peculiar and particular interest. The disease is present south of the Ohio River from the Atlantic to the States bordering on the Mississippi River wherever there are present accumulations of water in which the malaria-bearing mosquitoes can breed. Special studies have been made of the prevalence of the disease in Arkansas, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, and Tennessee. All three forms of the disease have been found present—tertian, quartan, and estivo-autumnal. The disease is also present in sections of Texas, in central California, and to some extent in Oregon. It is also present to a limited degree in certain localities in the New England States, and is said to be present in one or two localities of Michigan. Maryland has not been entirely free from the disease. Only very careful inquiry and investigation will establish definitely the territory in which the disease is present and that from which it is absent.

The disease is frequently mistaken for other conditions. Undoubtedly many of the deaths recorded as due to malaria are due to other conditions and not to malaria, although malaria is undoubtedly a frequent cause of death in those localities in which it is common.

The only State in which anything like satisfactory results are being obtained in the notification of cases of malaria is the State of Mississippi. This State frequently has more cases reported in one month than all the other States of the Union have in a year, not because there is more malaria in Mississippi than in other States, but because the cases in the other States are not reported.

Knowledge of the prevalence of the disease is the first step necessary to its eradication, and as Mississippi is accomplishing this step, it is safe to say that she will be one of the first of the affected States from which the disease will be eliminated.

MEASLES.

Measles is one of the most common diseases in the United States. In the larger cities cases occur by the thousands. So common has the disease been in the past that the average individual has looked upon it as an inevitable occurrence in the individual's history.

Measles is looked upon by the average householder as being a disease of little importance. On the other hand, there are those who inadvisedly proclaim measles as being one of the scourges of mankind.

The facts in the case are that, taken all in all, measles possibly causes death in one out of every 300 or 400 of those affected. Most of the deaths that occur take place in young children, children under 2 years of age. It is highly desirable, therefore, that at least babies be protected from the disease, and that its occurrence be delayed as long as possible. The older the child the less the danger.

Many of the deaths really due to measles are not charged to it. Lung complications are apt to follow the disease, and these are often serious and frequently fatal.

Measles is a disease which has a history of offering especial difficulties in getting reported. Physicians frequently do not report every case coming to their knowledge, and in some communities many cases are never seen by physicians. It is, however, communicable, and is not infrequently the cause of death in small children. It should, therefore, be controlled, if possible, by the health department, and of course can not be controlled unless the cases are reported.

The cases which were reported by States during the calendar year 1913 appear in the tables which follow:

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population, and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Arizona	230,808	9	1	6	1	1	1	17	3
California	2,667,516	229	4	200	8	266	8	315	29
Connecticut	1,181,793	591	2	619	6	821	11	1,113	17
District of Columbia	348,077	681	2	1,400	2	2,110	9	982	4
Hawaii	191,909	4	1	9	......	17	......	8	......
Idaho	378,818	18	......	138	1	205	1	160	1
Illinois	5,904,043	3,718	67	5,840	91	6,826	126	6,872	131
Indiana [1]	2,760,792	......	26	......	52	......	84	......	83
Iowa	2,222,472	......	2	......	9	......	24	......	32
Kansas	1,762,573	229	......	1,115	4	2,024	21	1,960	5
Maryland [2]	1,330,209	231	3	654	7	1,253	10	1,194	23
Massachusetts	3,548,705	3,236	......	4,412	......	5,206	......	5,580	......
Michigan	2,936,618	783	19	1,078	17	1,031	29	1,119	28
Minnesota [1]	2,181,077	338	......	838	15	1,157	41	1,318	36
Montana	419,174	43	1	171	1	375	4	408	5
Nebraska	1,233,122	......	1	......	2	......	6	......	2
Nevada	94,722	31	......	65	......	84	......	52	......
New York	9,712,954	6,609	99	7,920	88	9,877	152	10,611	132
Oklahoma	1,938,761	54	1	384	14	95	28	1,155	26
Oregon	756,988	28	......	95	......	159	2	204	......
South Carolina [1]	1,572,285	32	......	8	......	507	......	846	......
South Dakota [1]	643,121	374	1	301	......	300	6	555	7
Utah	404,735	2,001	12	2,620	31	2,039	20	1,941	19
Washington [1]	1,344,686	352	3	499	5	1,058	16	1,282	14
Wisconsin	2,419,898	454	5	218	7	900	16	1,133	25
Wyoming	163,325	......	......	......	1	11	......	25	1

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[1] The health officer states that cases are known not to be completely reported.

[2] Exclusive of the city of Baltimore.

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population, and fatality rates per 100 cases in the States for which records are available—Continued.

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Arizona	7	1	6	5	......	......	......	......	......	......
California	315	37	215	28	89	13	39	12	23	1
Connecticut	1,029	15	693	10	257	6	58	6	37	2
District of Columbia	329	6	131	1	29	......	5	......	3	......
Hawaii	17	......	56	......	30	......	7	......	2	......
Idaho	82	2	77	......	18	1	56	......	5	......
Illinois	4,599	83	2,856	63	671	22	159	13	132	5
Indiana [1]	......	91	......	49	......	16	......	10	......	2
Iowa	......	29	......	8	......	6	......	1	......	1
Kansas	2,024	21	104	......	71	......	32	1	15	......
Maryland [2]	851	18	508	12	285	7	50	1	48	4
Massachusetts	4,449	......	2,846	......	882	......	251	......	141	......
Michigan	1,586	48	1,060	29	251	30	102	27	113	5
Minnesota [1]	1,107	42	392	24	155	11	61	3	38	2
Montana	400	......	131	......	59	......	25	......	32	......
Nebraska	......	6	......	3	......	1	......	2	......	......
Nevada	107	1	23	......	2	......	3	......	5	......
New York	11,117	176	8,257	131	3,711	84	987	48	590	7
Oklahoma	586	22	250	13	120	9	21	......	14	......
Oregon	226	......	187	2	145	......	24	1	12	......
South Carolina [1]	256	......	200	......	67	......	103	......	45	......
South Dakota [1]	618	6	153	3	47	......	6	......	2	......
Utah	1,194	26	685	5	106	6	36	7	11	1
Washington [1]	970	18	319	15	86	9	35	3	39	......
Wisconsin	1,036	14	1,058	18	288	4	65	8	45	2
Wyoming	41	......	19	3	......	......	......	1	......	1

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Arizona	......	......	......	......	......	......	[3] 46	[3] 12	0.398	26.09
California	42	7	19	2	44	5	1,796	154	.673	8.57
Connecticut	121	3	282	5	741	14	6,362	97	5.383	1.52
District of Columbia	22	......	8	1	13	......	5,713	25	16.413	.44
Hawaii	2	......	2	......	7	......	161	1	.839	.62
Idaho	......	......	9	......	54	......	822	6	2.170	.73
Illinois	425	3	613	10	1,080	14	33,791	628	5.723	1.86
Indiana [1]	......	2	......	3	......	9	......	427	......	......
Iowa	......	1	......	1	......	3	......	117	......	......
Kansas	15	......	49	1	49	1	7,687	54	4.361	.70
Maryland [2]	18	......	56	3	204	......	5,352	88	4.023	1.64
Massachusetts	333	......	345	......	445	......	28,126	(4)	7.926	......
Michigan	451	8	540	6	1,151	11	9,265	257	3.155	2.77
Minnesota [1]	85	5	230	6	150	7	5,869	192	2.691	3.27
Montana	57	......	89	1	304	5	2,094	17	4.996	.81
Nebraska	......	......	......	......	......	......	......	23	......	......
Nevada	......	......	51	......	11	......	434	1	4.582	.23
New York	1,520	26	1,634	40	2,237	67	65,070	1,060	6.699	1.63
Oklahoma	27	1	75	1	43	4	2,824	119	1.457	4.21
Oregon	40	......	145	2	330	5	1,595	12	2.107	.75
South Carolina [1]	62	......	34	......	20	......	2,180	......	1.387	......
South Dakota [1]	7	......	15	......	33	......	2,411	23	3.749	.95
Utah	25	......	66	......	96	......	10,820	127	26.734	1.17
Washington [1]	95	3	178	2	377	5	5,290	93	3.934	1.76
Wisconsin	237	4	264	6	349	4	6,047	113	2.499	1.87
Wyoming	......	......	......	......	......	......	96	7	.588	7.29

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[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.
[3] For the first six months only.
[4] Deaths were not reported.

PELLAGRA.

Pellagra continues to be reported in many localities in the United States. Cases are particularly numerous in the South Atlantic and South Central States. To a lesser extent the disease has been reported in Illinois, Maryland, and the District of Columbia. Cases have in addition been recognized in practically every State. The disease is undoubtedly preventable, but its cause is still a matter of discussion.

POLIOMYELITIS (INFANTILE PARALYSIS).

There were no large outbreaks of poliomyelitis during the year. New York had 482 reported cases, Massachusetts 362, Virginia, 246, and Illinois 126 during the calendar year 1913.

The cases reported by months in those States which kept records of the occurrence of the disease are as follows:

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama	2,238,614	1	1	1	......	2	4	......	1
California	2,667,516	6	4	......	3	2	3	6	4
Connecticut	1,181,793	......	......	1	......	1	......	......	......
District of Columbia	348,077	1	......	1	......	......	......	......	......
Hawaii	191,909	......	......	......	1	......	......	......	......
Idaho	378,818	......	......	......	......	1	......	......	1
Illinois	5,904,043	9	4	17	2	20	4	7	2
Indiana	2,760,792	3	3	6	2	4	3	2	2
Iowa [1]	2,222,472	2	2	1	1	......	......	......	......
Kansas	1,762,573	5	2	1	......	......	......	1	1
Maryland [1] [2]	1,330,209	......	1	1	2	......	1	......	......
Massachusetts	3,548,705	4	......	4	......	4	......	2	......
Michigan	2,936,618	3	3	1	......	4	5	3	3
Minnesota [1]	2,181,077	2	4	1	1	2	2	2	5
Montana [1]	419,174	......	......	......	......	......	......	......	......
Nebraska	1,233,122	......	......	......	1	......	......	......	......
Nevada	94,722	1	......	......	......	......	......	......	......
New Jersey	2,749,486	2	1	6	1	5	1	3	......
New York	9,712,954	21	11	8	4	6	4	11	9
Oregon	756,988	......	......	1	......	1	......	......	......
South Dakota	643,121	......	......	2	2	1	1	......	......
Utah	404,735	......	......	......	......	......	......	......	......
Virginia	2,129,003	17	......	18	......	8	......	18	......
Washington [1]	1,344,686	1	1	......	......	3	......	1	1
Wisconsin	2,419,898	6	2	......	2	2	2	1	......

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[1] The health officer reports that cases are known not to be completely reported.

[2] Exclusive of the city of Baltimore.

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available—Continued.

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama	1	1	6	4	8	5				1
California	4	2	2	1	16	6	10	3	3	
Connecticut			1		2		3		4	
District of Columbia							1		2	
Hawaii							1			
Idaho		1	3				3		1	
Illinois	5	1	15	1	9	3	17	1	6	1
Indiana	5	3			22	8	23	6	14	5
Iowa [1]	1	1	2	2	7	1	17	11	14	4
Kansas	1				27	1	12	5	10	
Maryland [1] [2]		1		1	1		3	1	2	2
Massachusetts	6		1		10		60		125	
Michigan	1	1	4	1	1	3	18	7	12	5
Minnesota [1]			2	3	11	2	31	4	14	4
Montana [1]			1				1			
Nebraska		1				1		2		
Nevada			1	1			1			
New Jersey		4	3	1	3	2	12		16	6
New York	18	4	15	6	55	14	79	20	114	19
Oregon							1			1
South Dakota							2	2	1	
Utah		1		2				2		1
Virginia	20		11		28		39		36	
Washington [1]					1		6	2	1	1
Wisconsin			2	2	2	5	10	1	28	6

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Alabama		3			1			20		
California	19	1	14	5	8	1	90	33	0.033	36.67
Connecticut	11		4		2		29		.025	
District of Columbia							5		.014	
Hawaii	1		2		1		5	1	.026	20.00
Idaho	1	1			1	1	10	4	.026	40.00
Illinois	9	2	8	2	4		126	23	.021	18.25
Indiana	14	4	8	2	3		104	38	.038	36.54
Iowa [1]	1	3	3	3	2		50	28	.022	56.00
Kansas	22	6	9		2		90	15	.051	16.67
Maryland [1] [2]	1	2			2	1	10	12	.008	
Massachusetts	89		38		19		362	(3)	.102	
Michigan	3	1	4		2	2	56	31	.019	55.36
Minnesota [1]	4		5	1		1	74	27	.034	36.49
Montana [1]	6		1				9		.021	
Nebraska							5		.004	
Nevada	1		1				5	1	.053	20.00
New Jersey	16	2	7				73	18	.027	24.66
New York	98	16	35	13	22	3	482	123	.050	25.52
Oregon							3	1	.004	33.33
South Dakota	2						8	5	.012	62.50
Utah		1						7		
Virginia	20		21		10		246	(3)	.116	
Washington [1]	1		1	2	3	2	18	9	.013	50.00
Wisconsin	13	1	5	2	5	2	74	25	.031	33.78

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[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.
[3] Deaths were not reported.

RABIES.

Rabies continues to be reported in various sections of the United States. The disease, which had never been known to exist west of the Rocky Mountains until the last few years, is still spreading, and cases are being reported in California and Washington, and to some extent in Oregon.

STATE OF WASHINGTON.

The results of the invasion of the State of Washington with the infection of rabies is shown as it affected animals by the following abstract of a statement of the Washington State Board of Health made during the latter part of November, 1913:

In Pierce County clinical diagnosis of rabies was made in 7 dogs.

In King County microscopical verification of rabies was made in 1 dog at Wilburton and in another at Renton. It was stated that the dog at Wilburton had bitten 6 hogs, all of which had died of rabies.

From microscopical examinations made in the State board of health laboratory the presence of negri bodies was demonstrated in 7 dogs.

Six persons bitten by known rabid animals received treatment from the State board of health.

In the city of Tacoma microscopical examinations showed the presence of negri bodies in 25 dogs. In a herd of 15 cattle examined at Tacoma 8 were reported as positively affected with rabies. The number of animals in which the clinical diagnosis of rabies was made by veterinarians was stated to be about 75; none of these was verified by laboratory tests. It was stated that 30 persons bitten by known rabid animals had been given antirabic treatment.

In the city of Seattle positive clinical diagnosis of rabies was made in 132 dogs, and during the period from September 10 to October 30, 1913, 39 dogs were examined in the city laboratory. Negri bodies were found present in 29 of these dogs.

During the period from October 6 to 30, 1913, 13 persons in Seattle were reported as having been bitten by dogs known to have rabies.

STATE OF CALIFORNIA.

The conditions created in California by the introduction of the disease are illustrated by the following abstract of a statement of the California State Board of Health:

A sharp epidemic of rabies prevailed among the dogs of Alameda County, principally in Oakland and Berkeley, from August to November. The epidemic reached its height in October, when examinations of the brains of animals in the laboratory gave proof of the presence of the disease in 80 animals. During the four months of the epidemic the same laboratories found positive evidence of rabies in 159 of the heads sent from Alameda County.

An epidemic of rabies could not reach such proportions without endangering a large number of people. Many of those who were bitten secured the Pasteur preventive treatment from their physicians, and 55 persons from Alameda County received the treatment free at the State hygienic laboratory. The majority of these patients were bitten during October, the month in which the largest number of dogs came down with rabies.

During October and November vigorous efforts were made in Oakland and Berkeley to enforce muzzling ordinances. The result was a rapid diminution during November in the prevalence of rabies among dogs and in the number of persons bitten.

During the year 1913 the State hygienic laboratory examined the brains of 370 animals which had been suspected of having rabies, and found that the disease was present in 319 instances. The number of examinations showed a considerable increase over the figures for the year 1912. In that year 288 examinations were made and conclusive evidence that the disease was present was found in 243 of the specimens.

ROCKY MOUNTAIN SPOTTED FEVER.

Rocky Mountain spotted fever continues to occur in the Bitter Root Valley of Montana and in neighboring States. Careful inquiry made of physicians in the Western States on both sides of the Rocky Mountains reveals a considerable number of cases in the past. However, outside of the Bitter Root Valley the disease appears to be quite mild and only occasionally fatal. Many cases have been reported in Wyoming, Oregon, California, Idaho, Colorado, Utah, and Washington, but even in the worst infected districts the disease is only of secondary importance compared with such diseases as typhoid fever and tuberculosis. A case of Rocky Mountain spotted fever was reported in New York State in May, 1913, also one in Minnesota during the same month. The cases reported during the calendar year 1913 are shown in the following table:

Reported prevalence by months during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Idaho	378,818	2		2		8		67	3
Minnesota	2,181,077								
Montana	419,174						1		1
Nevada	94,722							1	
Oregon	756,988							2	2
Wyoming	163,325								

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Idaho	93	2	58		15	1	6	2	1	
Minnesota	1									
Montana		2		3				2		
Nevada	2	1			3					
Oregon	1	1								
Wyoming				1						

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Idaho							[1] 257	8		3.11
Minnesota							1			
Montana								9		
Nevada							6	1		16.67
Oregon							3	3		100.00
Wyoming								1		

[1] Including 5 cases not reported by months.

SCARLET FEVER.

Scarlet fever, like measles and diphtheria, is present in all sections of the country. The disease seems to have a higher fatality rate in northern localities than in southern. This, however, may be only apparent and not actual.

The disease is one of which there has always been some dread, and the diagnosis of the disease has always been associated with far greater fear than that of measles. The greater fatality rate of scarlet fever seems largely to justify this. The disease is one which should be controlled.

Its reported prevalence in the States which maintain records of the prevalence of disease is shown in the tables which follow:

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama [1]	2,238,614	16	2	35	4	52	1	18	....
Arizona	230,808	5	2	7	....	2	1	9	2
California	2,667,516	154	4	85	5	195	1	104	8
Connecticut	1,181,793	416	23	328	20	401	18	252	9
District of Columbia	348,077	86	3	60	2	83	3	49	1
Hawaii	191,909	1	1	1	....	....	....	1	....
Idaho	378,818	31	3	33	2	8	....	18	1
Illinois	5,904,043	2,355	150	2,099	156	2,376	189	1,825	115
Indiana	2,760,792	564	13	699	24	641	38	578	24
Iowa	2,222,472	111	13	134	7	141	14	122	9
Kansas	1,762,573	233	5	194	3	213	4	124	4
Maryland [2]	1,330,209	82	2	78	....	62	....	30	3
Massachusetts	3,548,705	961	....	943	....	1,017	....	812	....
Michigan	2,936,618	509	37	604	25	620	45	481	48
Minnesota	2,181,077	263	9	362	11	536	31	515	27
Montana	419,174	58	2	58	2	120	11	158	24
Nebraska	1,233,122	....	4	....	4	....	14	....	10
Nevada	94,722	18	....	30	....	22	....	15	....
New Jersey	2,749,486	712	20	572	25	700	33	568	28
New York	9,712,954	2,221	89	2,183	86	2,730	130	2,294	122
Oklahoma	1,938,761	121	2	117	1	214	2	102	....
Oregon	756,988	88	2	68	5	88	3	89	2
South Carolina	1,572,285	10	....	3	....	12	....	6	....
South Dakota [1]	643,121	58	3	48	4	104	3	53	....
Utah	404,735	93	1	196	3	101	3	70	....
Washington	1,344,686	78	1	60	1	87	8	104	2
Wisconsin	2,419,898	425	23	271	38	354	26	393	23
Wyoming	163,325	3	1	7	4	7	....	16	....

[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population, and fatality rates per 100 cases in the States for which records are available—Continued.

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama [1]	12	1	13	....	17	....	20	....	37	3
Arizona	1	....	3	1	....	....	....	....	....	....
California	132	14	85	14	100	5	78	4	84	7
Connecticut	231	8	203	5	87	6	56	6	67	....
District of Columbia	48	2	21	1	20	....	14	....	20	....
Hawaii	1	....	....	....	4	....	1	....	....	....
Idaho	5	1	21	....	8	....	....	....	1	1
Illinois	1,539	111	1,076	103	493	45	309	24	323	29
Indiana	357	20	320	16	97	4	135	6	227	8
Iowa	95	5	36	1	12	2	12	2	24	1
Kansas	213	4	47	1	39	1	46	2	48	....
Maryland [2]	30	....	31	1	31	4	18	3	58	2
Massachusetts	721	....	521	....	251	....	196	....	268	....
Michigan	409	24	250	21	96	13	125	9	201	8
Minnesota	394	27	223	14	174	10	113	9	95	7
Montana	155	13	67	11	50	3	23	3	32	5
Nebraska	....	4	....	3	....	4	....	....	....	2
Nevada	23	2	11	1	5	....	....	....	....	....
New Jersey	539	22	382	18	142	11	96	9	198	8
New York	2,037	126	1,310	98	663	42	436	21	535	21
Oklahoma	28	2	27	....	36	8	48	....	34	2
Oregon	75	....	50	3	46	1	25	1	33	1
South Carolina	5	....	6	....	6	....	14	....	19	....
South Dakota [1]	54	4	18	2	20	....	6	....	18	....
Utah	42	1	32	....	42	....	33	....	33	2
Washington	63	4	30	4	35	....	30	....	47	3
Wisconsin	236	20	192	13	89	11	68	2	61	7
Wyoming	25	....	2	2	3	....	7	1	8	....

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Alabama [1]	67	1	33	1	32	4	352	17	0.157	4.83
Arizona	....	....	....	....	....	....	[3] 27	[3] 6	.234	22.22
California	244	1	228	14	206	8	1,695	85	.635	5.01
Connecticut	120	7	155	5	183	9	2,499	116	2.115	4.65
District of Columbia	64	....	37	....	54	1	556	13	1.597	2.34
Hawaii	2	....	3	....	....	....	14	1	.073	7.14
Idaho	....	....	27	....	55	2	207	10	.546	4.83
Illinois	625	27	879	31	837	40	14,736	1,020	2.496	6.92
Indiana	483	11	486	13	484	13	5,071	190	1.837	3.75
Iowa	66	2	92	7	107	7	952	70	.429	7.35
Kansas	122	3	109	5	109	5	1,497	37	.849	2.47
Maryland [2]	130	4	120	4	152	....	822	23	.618	2.80
Massachusetts	503	....	747	....	1,120	....	8,060	(4)	2.271	....
Michigan	234	15	267	8	315	17	4,111	270	1.400	6.57
Minnesota	190	6	250	10	370	20	3,487	181	1.599	5.19
Montana	60	3	83	1	76	1	940	79	2.243	8.40
Nebraska	....	7	....	....	....	....	....	52	....	....
Nevada	3	....	6	....	1	....	134	3	1.415	2.24
New Jersey	245	10	295	8	357	16	4,806	208	1.748	4.33
New York	663	25	867	30	1,246	41	17,185	831	1.769	4.84
Oklahoma	34	....	81	2	80	33	922	52	.476	5.64
Oregon	33	3	36	....	29	....	660	21	.872	3.18
South Carolina	18	....	10	....	14	....	123	....	.078	....
South Dakota [1]	24	1	33	2	41	1	477	20	.742	4.19
Utah	81	....	129	2	168	3	1,020	15	2.520	1.47
Washington	66	4	96	....	101	2	797	29	.593	3.64
Wisconsin	167	3	213	6	255	7	2,724	179	1.126	6.57
Wyoming	16	....	9	3	12	....	115	11	.704	9.57

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[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.
[3] For the first 6 months only.
[4] Deaths were not reported.

SMALLPOX.

Smallpox is still prevalent in the United States. The infection, however, continues to be of the mild type, in which the fatality rate seldom exceeds one-fifth of 1 per cent. The virulent type of smallpox has occurred to a limited extent in California, Texas, Oklahoma, and Arkansas. The infection in California and Texas came direct from Mexico, and the infection in Oklahoma and Arkansas from Mexico apparently by way of Texas.

Occasionally, infection of the virulent type is brought into the country by immigrants. Under such circumstances it occasionally gives rise to virulent outbreaks of varying sizes. Usually, however, it produces no secondary cases, owing to the fact that the immigration laws and regulations require that all immigrants shall be vaccinated unless they can show evidence of recent vaccination or of having had smallpox. Being surrounded by those rendered immune by vaccination, the disease usually does little or no harm.

The mild strain of the disease does not seem ever to assume the virulence of the virulent type of the disease. Occasionally there is a death from the mild infection. Rarely one infected with the mild type will have a confluent eruption. However, the cases contracted from these apparently severe confluent cases of the disease are mild and not virulent, so that the severe symptoms of the confluent cases would appear to be due to an unusual susceptibility of the host rather than to a greater virulence of the causative organism.

From the autumn of 1912 to May, 1914, there occurred in Evansville, Ind., over 1,300 recognized cases of smallpox. The population of Evansville according to the census of 1910 was 67,920. The infection was of the mild type.

In Niagara Falls, N. Y., between November 3, 1913, and March 11, 1914, there were 458 recognized cases of smallpox. The population of Niagara Falls in 1910 was 12,016. The disease was of the mild virulent type.

In Arkansas there was an outbreak of virulent smallpox at Springdale and vicinity. The infection had been introduced from Mexico. During February and the first half of March, 1914, there occurred 23 cases of the virulent type of the disease with 9 deaths. It was interesting that in the same county there occurred at approximately the same time an outbreak of mild smallpox which was distinct from the other and was due to the introduction of the mild infection from an adjoining State.

The fact that the two types of the disease, the mild and the virulent, retain their essential characteristics is of much interest and considerable importance. An illustration of the manner in which the mild strain of the infection remains mild, even when transported for long distances to a different climate, and even to an aboriginal and unvaccinated race, is the introduction of the disease into New Zealand by persons from Utah. The following is quoted from a statement by the district health officer at Auckland:

> We have recently undergone in New Zealand a fairly widespread epidemic of smallpox of the mild type which seems to have been prevalent in America during the last 12 years. It appeared simultaneously in Australia, where, among nearly 900 cases, no deaths have occurred. In our case the disease has been almost entirely confined to the Maori race, who are peculiarly susceptible to infectious diseases, more especially of the pustular type. The cases among these natives were, on the whole,

much more severe than those among Europeans. In some cases the disease had all the appearance of confluent smallpox, and in a small percentage even proved fatal, yet other natives infected from such severe cases might take it in the usual mild form, and there was no evidence that it worked up in virulence permanently to the normal degree of severity. The majority of the cases even in natives, very few of whom were vaccinated, were more like chickenpox so far as severity was concerned.

The prevalence of the disease as reported by States for the calendar year 1913 is shown on pages 282 to 284.

A number of States ascertain in each case of smallpox whether the patient has ever been vaccinated and, if he has, the number of times and when. The records of these States giving the vaccination histories of smallpox patients as reported to the bureau are shown on page 285.

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama	2,238,614	166	2	130	....	106	....	98	1
Arizona	230,808	1	....	40	....	57	....	51	....
California	2,667,516	85	8	51	1	105	....	101	1
Colorado	883,276	33	....	37	....	27	....	23	....
Connecticut	1,181,793	4	....	7	....	5	....	3	....
District of Columbia	348,077	15	....	10	....	37	....	5	....
Florida	825,420	246	....	211	....	217	1	113	....
Idaho	378,818	73	....	96	2	27	....	42	....
Illinois	5,904,043	256	1	235	1	412	1	312	....
Indiana	2,760,792	350	....	499	....	463	1	540	....
Iowa	2,222,473	234	....	294	3	416	....	336	1
Kansas	1,762,573	41	....	84	1	87	....	228	2
Maine	757,936	25	....	16	....	34	1	36	....
Maryland [1]	1,330,209	34	1	20	....	15	....	12	....
Massachusetts	3,548,705	9	....	6	....	24	....	21	....
Michigan	2,936,618	217	....	220	1	275	1	200	....
Minnesota [2]	2,181,077	522	1	510	....	452	....	407	2
Montana	419,174	73	....	86	....	79	....	89	1
Nebraska	1,233,122	....	....	....	....	....	....	....	....
Nevada	94,722	99	....	30	....	24	....	35	....
New Jersey	2,749,486	25	....	10	....	5	....	2	....
New York	9,712,954	67	....	64	....	94	....	129	....
North Dakota	660,849	16	....	18	....	36	....	66	....
Ohio	4,965,169	153	....	134	....	259	....	203	1
Oklahoma	1,938,761	332	23	257	29	284	8	308	2
Oregon	756,988	113	....	129	....	126	....	107	1
Pennsylvania	8,107,942	29	9	33	8	32	1	10	....
South Carolina	1,572,285	28	....	32	....	85	....	190	....
South Dakota [2]	643,121	63	....	50	....	124	....	116	....
Texas	4,171,997	374	38	342	8	204	4	217	3
Utah	404,735	500	....	483	2	376	4	247	....
Vermont	359,957	34	....	21	1	6	....	26	....
Virginia	2,129,003	231	....	149	....	125	....	127	....
Washington	1,344,686	239	....	192	1	211	1	192	....
Wisconsin	2,419,898	194	....	180	....	180	2	257	....
Wyoming	163,325	15	....	47	....	1	....	1	....
Total	....	4,896	83	4,723	58	5,010	25	4,850	15

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[1] Exclusive of the city of Baltimore.

[2] The health officer states that cases are known not to be completely reported.

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available—Continued.

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama	130	1	129	1	61		32	1	2	
Arizona	33	1	25							
California	115	1	52	3	41		35		35	
Colorado	32		35		25		6		3	
Connecticut			1		1		2		4	
District of Columbia	34		26		3		2		2	
Florida	94		88		71		29		8	
Idaho	8		139	1	23		17		30	
Illinois	272		163		120		46		38	
Indiana	359		203	1	110	1	135		69	
Iowa	229		134		46		15		21	
Kansas	87		20		41	1	10		14	
Maine	27		10		10					
Maryland [1]	26		20		2				2	
Massachusetts	11		52		5		7		5	
Michigan	193		122		117	1	69		53	
Minnesota [2]	213	3	115	1	129		26		37	
Montana	48		61		59		27		19	
Nebraska		2				1				
Nevada	50		17		2					
New Jersey	1		14						1	
New York	87		77		72	1	27		32	
North Dakota	10		13		39		13		5	
Ohio	183	1	258	1	129		92		68	
Oklahoma	197	1	107	1	72	3	39		26	1
Oregon	77		93		76	1	15		17	
Pennsylvania	25		44					1		
South Carolina	123		78		29		34		4	
South Dakota [2]	46		46		30		30		19	
Texas	221	3	108		88	3	15		16	
Utah	160		120		74		63		66	
Vermont	21		13		11					
Virginia	83		66		70		69		35	
Washington	190		135		61		36		39	
Wisconsin	143		141		55		57		62	
Wyoming	2		19		21		8		2	
Total	3,530	13	2,754	9	1,693	12	956	2	734	1

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[1] Exclusive of the city of Baltimore.

[2] The health officer states that cases are known not to be completely reported.

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available—Continued.

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Alabama	12	....	35	....	25	....	926	6	0.414	0.65
Arizona	....	....	....	....	....	....	[3] 207	[3] 1	....	....
California	35	....	64	1	81	....	800	15	.300	1.88
Colorado	24	....	29	....	15	....	289	....	.327	....
Connecticut	79	....	38	....	46	1	190	1	.161	.53
District of Columbia	....	....	1	....	5	....	140	....	.402	....
Florida	54	1	17	1	18	....	1,166	[4] 4	1.413	.34
Idaho	6	....	32	....	116	....	609	3	1,608	.49
Illinois	70	....	281	....	300	....	2,505	3	.424	.12
Indiana	73	3	126	4	183	....	3,110	10	1.126	.32
Iowa	53	....	114	1	239	....	2,131	5	.959	.24
Kansas	24	....	83	....	83	....	812	4	.461	.49
Maine	....	....	....	....	....	....	[3] 158	[3] 1	....	....
Maryland [1]	....	....	1	....	....	1	132	2	.099	1.52
Massachusetts	8	....	6	....	3	....	157	....	.044	....
Michigan	83	....	257	....	182	....	1,988	3	.677	.15
Minnesota [2]	114	....	125	....	216	....	2,866	7	1.314	.24
Montana	54	....	65	1	78	1	738	3	1.761	.41
Nebraska	....	....	....	7	....	....	....	10	....	....
Nevada	1	....	2	....	1	....	261	....	2.755	....
New Jersey	2	....	3	....	....	....	63	....	.023	....
New York	21	....	73	....	85	....	828	1	.085	.12
North Dakota	67	....	39	....	73	....	395	....	.598	....
Ohio	200	....	353	....	529	1	2,561	4	.516	.16
Oklahoma	25	....	102	4	161	8	1,910	80	.985	4.19
Oregon	30	1	188	....	43	....	1,014	3	1.340	.30
Pennsylvania	....	....	....	....	....	....	[3] 173	[3] 19	....	....
South Carolina	13	....	27	....	38	....	681	....	.433	....
South Dakota [2]	25	....	17	....	92	....	658	....	1.023	....
Texas	26	....	56	1	99	3	1,766	63	.423	3.57
Utah	99	....	124	....	131	....	2,443	6	6.014	.25
Vermont	....	....	....	....	2	....	134	1	.372	.75
Virginia	87	....	173	....	283	....	1,498	....	.704	....
Washington	89	....	91	....	145	....	1,620	2	1.205	.12
Wisconsin	69	....	268	....	446	....	2,052	2	.848	.10
Wyoming	1	....	6	....	5	....	128	....	.784	....
Total	1,444	5	2,796	20	3,723	15	37,109	[4] 259	....	....

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[1] Exclusive of the city of Baltimore.
[2] The health officer states that cases are known not to be completely reported.
[3] Incomplete.
[4] Including 1 death not reported by month.

Reported cases in which vaccination histories of patients were given.

State and year.	Cases reported.	Vaccination history of cases.				Remarks.
		Vaccinated within 7 years preceding attack.	Last vaccinated more than 7 years preceding attack.	Never successfully vaccinated.	Vaccination history not obtained or uncertain.	
1912.						
Massachusetts	37	1	1	23	12	October, November, December.
Minnesota	1,066	25	76	775	190	7 months—June–December.
Montana	20			4	16	November only.
New York	372		29	204	139	October, November, December.
1913.						
California	662	24	36	419	183	10 months—March to December.
Maryland (exclusive of Baltimore).	103		6	97		Except May and July.
Massachusetts	152	23	16	76	37	Except July.
Michigan	1,478	15	55	1,114	294	
Minnesota	2,861	47	201	2,255	358	
New York	737	22	94	432	189	Except June.
Ohio	1,782	10	21	763	988	Except February, March, April, and May.
Vermont	34		1	9	24	January only.
Wisconsin	2,054	160	195	520	1,179	
1914 (to June 30).						
California	537	14	39	293	191	
District of Columbia	27	4	3	20		March only.
Maryland (exclusive of Baltimore).	190		2	188		
Massachusetts	25	1	4	19	1	
Michigan	928	3	31	768	126	
Minnesota	1,246	13	77	895	261	
New York	721	38	32	548	103	
Ohio	3,462	8	40	1,183	2,231	
Wisconsin	2,341	132	145	631	1,433	
Total	20,835	540	1,104	11,236	7,955	

TUBERCULOSIS.

Of all the controllable diseases tuberculosis possibly exacts the greatest toll in lives. The organism which causes the disease was discovered more than 30 years ago. The manner in which the disease is usually spread, however, seems to be still a matter of some dispute. The view of the laboratory worker is inclined to be that individuals are almost invariably infected in childhood, and after the primary infection are immune against a second infection from the outside, and that the clinical development of the disease in afterlife is due to a superinfection from lesions contracted in early years. However, clinicians for the most part hold the belief that the disease is communicable from individual to individual at any stage in life.

Those who hold this latter view are supported largely by such work as that done by Lampson in the study of tuberculosis in households. Lampson's work, however, has not been repeated by others, and it may be said that the actual means by which tuberculosis is usually spread is at the present time a matter of discussion, and until this point is settled it will be impossible to determine what measures, if any, will be effectual in controlling the disease. It is quite possible that this information will be gained only after the study by competent men of the relation of cases to each other and of the conditions under which they occur.

The disease is notifiable in many States. The results of notification are of peculiar and particular interest. Maryland has approximately 3 cases reported for each death recorded. Kansas has a little over 3 cases reported for each death. South Dakota has 7 cases reported for each death. On the other hand, Connecticut and Minnesota have had only a little over 1 case for each death. New York has had a little over 2 cases for each death.

The number of cases of the disease reported in the several States in which the disease is notifiable is shown by the tables which follow:

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama [1]	2,238,614	94	175	81	163	124	180	69	196
California	2,667,516	192	485	33	478	203	500	200	493
Connecticut	1,181,793	207	124	148	135	191	133	172	141
District of Columbia	348,077	127	60	108	73	93	93	125	77
Hawaii	191,909	35	28	58	26	47	37	53	30
Illinois	5,904,043	......	572	......	542	......	617	......	577
Indiana	2,760,792	......	355	......	327	......	420	......	383
Iowa	2,222,472	......	142	......	102	......	123	......	137
Kansas [1]	1,762,573	77	26	55	24	51	29	65	14
Maryland [2]	1,330,209	274	98	275	106	274	97	274	93
Massachusetts	3,548,705	648	......	616	......	764	......	719	......
Michigan	2,936,618	187	203	99	212	95	231	221	249
Minnesota [1]	2,181,077	156	180	159	195	199	232	188	228
Montana [1]	419,174	......	47	......	48	......	37	5	31
Nebraska	1,233,122	......	49	......	46	......	44	......	50
Nevada	94,722	13	5	12	5	16	4	20	6
New Jersey	2,749,486	693	373	575	372	617	424	731	367
New York	9,712,954	2,765	1,183	2,534	1,201	3,113	1,395	3,011	1,317
Oklahoma	1,938,761	69	50	84	73	84	78	72	67
Oregon	756,988	24	45	26	46	31	65	28	60
South Carolina	1,572,285	12	......	14	......	32	......	74	......
South Dakota [1]	643,121	3	1	......	......	......	......	......	......
Utah [1]	404,735	7	6	11	14	20	23	16	11
Virginia	2,129,003	355	......	338	......	347	......	381	......
Washington [1]	1,344,686	46	84	67	102	146	110	87	113
Wisconsin	2,419,898	127	162	102	155	116	208	165	163
Wyoming	163,325	......	1	......	10	......	2	......	2

[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases in the States for which records are available—Continued.

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama [1]	100	178	88	175	63	164	76	156	53	174
California	141	474	120	446	182	418	163	383	204	391
Connecticut	152	105	160	126	182	109	139	113	156	96
District of Columbia	104	88	110	61	125	62	79	64	83	59
Hawaii	50	31	51	28	45	29	44	37	42	25
Illinois	......	580	......	509	......	503	......	503	......	482
Indiana	......	384	......	338	......	320	......	323	......	275
Iowa	......	136	......	125	......	114	......	106	......	100
Kansas [1]	68	20	52	15	77	22	46	14	60	11
Maryland [2]	384	99	248	103	306	95	167	104	375	78
Massachusetts	830	......	747	......	626	......	652	......	530	......
Michigan	239	277	212	198	207	244	102	191	213	200
Minnesota [1]	232	204	212	214	294	174	275	186	224	153
Montana [1]	6	31	44	31	13	20	15	29	10	20
Nebraska	......	52	......	38	......	48	......	35	......	30
Nevada	14	5	13	5	5	1	7	6	10	5
New Jersey	841	411	749	313	700	308	651	310	623	293
New York	2,636	1,309	2,574	1,107	2,941	1,025	2,162	978	2,339	938
Oklahoma	62	66	66	61	56	33	59	40	72	42
Oregon	26	66	51	49	18	51	31	50	23	37
South Carolina	47	......	31	......	41	......	49	......	48	......
South Dakota [1]	......	......	......	......	3	1	2	......	4	1
Utah [1]	11	21	10	6	4	12	17	16	12	10
Virginia	349	......	333	......	391	......	533	......	353	......
Washington [1]	76	104	76	107	68	107	84	103	74	98
Wisconsin	139	195	183	52	129	155	123	134	81	141
Wyoming	......	3	......	4	......	7	......	5	......	2

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Alabama [1]	59	149	86	142	86	157	979	2,009	....	....
California	410	442	384	415	339	445	2,571	5,370	0.964	....
Connecticut	137	92	138	95	156	127	1,938	1,396	1.640	72.03
District of Columbia	80	55	91	57	56	54	1,176	803	3.379	68.28
Hawaii	44	40	42	31	54	32	568	374	2.960	65.85
Illinois	......	459	......	434	......	507	......	6,285	....	....
Indiana	......	280	......	286	......	302	......	3,993	....	....
Iowa	......	113	......	85	......	109	......	1,392	....	....
Kansas [1]	49	9	72	22	49	17	721	223	.409	30.93
Maryland [2]	236	85	229	83	257	81	3,299	1,122	2.480	34.01
Massachusetts	563	......	653	......	564	......	8,012	(3)	2.258	....
Michigan	99	163	129	181	117	223	1,920	2,572	....	....
Minnesota [1]	200	181	180	123	197	166	2,516	2,236	1.154	88.87
Montana [1]	9	32	16	23	6	29	124	378	....	....
Nebraska	......	46	......	34	......	......	......	472	....	....
Nevada	3	1	15	5	14	4	142	52	1.499	36.62
New Jersey	631	302	621	309	622	327	8,054	4,109	2.929	51.02
New York	2,526	1,012	2,306	1,027	2,164	1,165	31,071	13,657	3.199	43.95
Oklahoma	55	32	49	41	63	39	791	622	.408	78.63
Oregon	28	44	26	46	46	29	358	588	....	....
South Carolina	30	......	15	......	16	......	409	......	.260	....
South Dakota [1]	8	1	10	......	4	1	34	5	.053	14.71
Utah [1]	21	14	13	15	16	16	158	164	....	....
Virginia	389	......	438	......	390	......	4,597	(3)	2.159	....
Washington [1]	97	73	73	81	112	115	1,006	1,197	....	....
Wisconsin	152	123	137	151	167	163	1,621	1,802	....	....
Wyoming	......	1	......	1	......	3	......	41	....	....

[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.
[3] Deaths were not reported.

TYPHOID FEVER.

Typhoid fever continues to be prevalent almost to the extent that it may be termed a national disease. With the improvement of water supplies, sewage disposal, and housing and living conditions in cities, the disease has to some extent been brought under control. In the smaller communities, however, and in the localities usually designated as rural the prevalence of the disease continues unabated. The disease is strictly controllable. This, however, requires some effort and expenditure for its accomplishment.

The prevalence of the disease as reported in those States in which its prevalence is watched and recorded is shown for the calendar year 1913 in the tables which follow:

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases for those States for which records are available.

State.	Estimated population July 1, 1913.	January.		February.		March.		April.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama	2,238,614	67	33	63	15	50	17	38	28
Arizona	230,808	1	....	......	1	2	4	1	1
California	2,667,516	81	22	23	23	53	24	46	23
Connecticut	1,181,793	46	4	30	7	11	3	42	3
District of Columbia	348,077	25	4	9	4	15	4	12	2
Hawaii	191,909	10	6	26	4	23	3	26	7
Idaho	378,818	......	1	......	1	1	1	......	1
Illinois	5,904,043	313	38	208	52	164	30	149	32
Indiana [1]	2,760,792	74	26	81	27	53	27	117	27
Iowa	2,222,472	......	23	......	13	......	11	......	13
Kansas [1]	1,762,573	32	2	35	5	17	3	15	....
Maryland [2]	1,330,209	105	12	102	7	70	20	93	7
Massachusetts	3,548,705	156	....	137	....	83	....	112	....
Michigan	2,936,618	131	42	112	26	79	33	153	38
Minnesota [1]	2,181,077	48	17	68	16	33	14	50	9
Montana	419,174	21	4	39	8	39	4	20	6
Nebraska	1,233,122	......	5	......	4	......	2	......	8
Nevada	94,722	12	....	4	....	4	....	2	....
New Jersey	2,749,486	86	14	53	8	47	8	66	9
New York	9,712,954	257	54	221	47	189	55	404	46
Oklahoma	1,938,761	60	19	38	9	25	5	139	8
Oregon	756,988	21	8	17	4	23	3	16	5
South Carolina	1,572,285	3	....	7	....	33	....	66	....
South Dakota [1]	643,121	3	....	4	....	1	....	......	....
Utah	404,735	11	....	13	2	22	2	31	3
Virginia	2,129,003	143	....	227	....	115	....	112	....
Washington	1,344,686	15	3	26	2	31	10	20	3
Wisconsin	2,419,898	52	24	28	17	35	17	65	21
Wyoming	163,325	......	1	1	2	......	....	......	....

[1] The health officer states that cases are known not to be completely reported.
[2] Exclusive of the city of Baltimore.

Reported prevalence, by months, during the calendar year 1913; case rates per annum per 1,000 population; and fatality rates per 100 cases for those States for which records are available—Continued.

State.	May.		June.		July.		August.		September.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama	73	32	153	51	226	94	200	79	170	85
Arizona	3	4	4	3	......	......	......	......	......	......
California	83	23	95	34	213	47	183	49	165	47
Connecticut	45	8	41	7	80	16	192	22	238	23
District of Columbia	17	3	65	5	70	7	72	9	75	2
Hawaii	14	3	20	9	14	5	18	5	20	7
Idaho	......	1	10	2	12	5	26	4	56	7
Illinois	177	48	165	45	441	35	662	92	826	85
Indiana[1]	81	32	96	25	397	47	722	112	533	106
Iowa	......	19	......	20	......	15	......	23	......	31
Kansas[1]	17	3	41	2	149	9	299	22	229	13
Maryland[2]	92	14	151	19	425	28	640	60	531	42
Massachusetts	93	......	101	......	178	......	375	......	458	......
Michigan	109	27	135	27	162	41	332	52	484	74
Minnesota[1]	25	5	53	7	90	16	165	14	286	23
Montana	21	3	17	1	54	5	59	4	65	10
Nebraska	......	7	......	6	......	9	......	20	......	9
Nevada	4	......	5	......	11	1	29	1	55	7
New Jersey	107	16	60	14	151	30	293	35	353	44
New York	348	63	222	49	417	86	620	103	1,338	127
Oklahoma	63	19	192	14	406	46	516	66	320	49
Oregon	9	3	14	1	18	6	79	4	53	6
South Carolina	84	......	128	......	154	......	177	......	95	......
South Dakota[1]	......	......	......	......	5	......	11	1	42	2
Utah	21	2	37	4	107	12	121	10	292	10
Virginia	221	......	668	......	1,114	......	1,442	......	783	......
Washington	25	5	32	6	61	14	165	7	134	14
Wisconsin	55	19	54	13	39	15	41	16	53	19
Wyoming	4	......	1	1	6	......	13	6	13	3

State.	October.		November.		December.		Total cases, 1913.	Total deaths, 1913.	Case rate per annum per 1,000 inhabitants.	Fatality rate per 100 cases.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.				
Alabama	139	53	75	47	49	31	1,303	565	0.582	43.36
Arizona	......	......	......	......	......	......	[3]11	[3]13	......	......
California	284	52	124	56	134	35	1,484	435	.556	29.31
Connecticut	98	12	90	16	41	8	954	129	.807	13.52
District of Columbia	40	11	35	2	26	4	461	57	1.324	12.36
Hawaii	10	4	15	4	19	6	215	63	1.120	29.30
Idaho	23	12	30	6	18	3	176	44	.465	25.00
Illinois	766	107	617	93	438	69	4,926	726	.834	14.74
Indiana[1]	486	126	314	80	181	60	3,135	695	1.136	22.17
Iowa	......	32	......	22	......	25	......	247	......	......
Kansas[1]	211	15	151	9	151	9	1,347	92	.764	6.83
Maryland[2]	407	39	246	34	122	24	2,984	306	2.243	10.25
Massachusetts	365	......	223	......	117	......	2,398	(4)	.678	......
Michigan	287	66	187	60	142	44	2,313	530	.788	22.91
Minnesota[1]	245	50	142	33	93	22	1,298	226	.595	17.41
Montana	108	14	43	11	37	11	523	81	1.248	15.49
Nebraska	......	13	......	15	......	......	......	98	......	......
Nevada	39	7	12	1	8	1	185	18	1.953	9.73
New Jersey	265	40	163	25	73	11	1,717	254	.624	14.79
New York	1,177	172	608	121	399	96	6,200	1,001	.638	16.15
Oklahoma	238	35	180	43	119	26	2,296	339	1.184	14.76
Oregon	49	13	17	9	9	4	325	66	.429	20.31
South Carolina	55	......	47	......	20	......	869	......	.553	......
South Dakota[1]	32	4	25	2	20	5	143	14	.222	9.79
Utah	180	19	186	11	42	15	973	90	2.404	9.25
Virginia	543	......	388	......	212	......	5,968	(4)	2.803	......
Washington	100	18	54	14	70	25	733	121	.545	16.51
Wisconsin	108	22	72	10	75	15	677	208	.280	30.72
Wyoming	16	5	15	4	3	3	72	25	.441	34.72

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[1] The health officer states that cases are known not to be completely reported.

[2] Exclusive of the city of Baltimore.

[3] For the first 6 months only.

[4] Deaths were not reported.

TYPHUS FEVER.

A number of cases of typhus fever have arrived at American ports in immigrants. Aside from these, however, cases have been reported as follows:

Virginia—Laurel.—A case diagnosed clinically as typhus fever was reported at Laurel, Va., in the person of a male, white, aged 60; taken sick June 29, 1914, and removed to Richmond, Va., July 5.

Washington—Loomis.—The State Board of Health of Washington reported that during the month of June, 1913, one fatal case of typhus fever had been notified in Loomis, Okanogan County, Wash.

Massachusetts—Taunton.—The State Board of Health of Massachusetts reported November 13, 1913, that a fatal case of typhus fever had been notified at Taunton, Mass.

Rhode Island—Providence.—January 3, 1914, two cases of typhus fever were reported at Providence, R. I., one having been taken sick December 24 and the other December 27, 1913. Three other cases of illness which were not at the time diagnosed as typhus fever but which, in view of later developments, are believed to have been typhus, occurred in Providence during the latter part of November and the early part of December. The patients in all of these cases had been to some extent associated. The infection is believed to have been introduced by passengers of the steamship *Germania*, which arrived November 30 at Providence from Marseille, France. The first cases are believed to have been in passengers from this vessel. At Providence 1 case was reported January 7, 1914, and 1 February 21.

The frequency with which typhus fever arrives among immigrants is shown by the following record of cases arriving during the first 10 weeks of 1914:

	Cases.
At Providence:	
Jan. 1, 1914, steamer *Roma*, from Marseille	1
Jan. 4, 1914, steamer *Roma*, from Marseille	1
At New York:	
Jan. 17, 1914, steamer *Belvidere*, from Trieste	4
Jan. 18, 1914, steamer *Kaiser Franz Joseph I*, from Trieste	1
Jan. 27, 1914, steamer *Rochambeau*, from Havre	2
Mar. 4, 1914, steamer *Pannonia*, from Trieste	1
Mar. 8, 1914, steamer *La Savoie*, from Havre	1

World Prevalence of Cholera, Plague, and Yellow Fever.

CHOLERA.

During the year cholera was present to some extent in most of its usual haunts. Its chief occurrence was in Asia. No epidemic of importance occurred in Europe excepting in Austria-Hungary, Bulgaria, Roumania, and Servia.

The disease was present in various places in Austria-Hungary, especially in Bosnia, Croatia, and Hungary. In most instances only a few cases were reported in a locality. More than 100 reported cases in any one locality was quite unusual. The disease appeared also in Bulgaria and in Roumania. In Roumania it was epidemic and the reported cases totaled several thousand. In Austria-Hungary there were probably in all two or three thousand cases. In Bulgaria, between August 25 and October 27, there were nearly

11,000 reported cases. In Roumania, from August 1 to November 17, there were nearly 6,000 reported cases.

In Turkey cases were reported at Adrianople, Constantinople, and various other points; in all, several hundred cases were reported. A few cases were also reported in Greece among troops at quarantine. Russia, in which the disease had during previous years been prevalent, had comparatively few cases. Three or four hundred cases were reported, mainly in the southern governments.

Between July 4 and November 9, 1913, approximately 5,000 cases were reported in Servia.

The infection in Europe seemed to be limited almost entirely to Austria-Hungary and the Balkans. The disease was most prevalent during the autumn and early winter months of 1913.

In Asia the disease was present in Ceylon, various parts of China, the Dutch East Indies, various parts of India, Indo-China, a few cases in Japan, and a few cases in the Philippine Islands. At Manila there were 186 cases between August 23, 1913, and January 24, 1914. There were a few cases in Siam and in the Straits Settlements, also in Turkey. The disease seemed to be present throughout southern Asia excepting in those parts having only limited communication with other localities.

In Africa 2 cases were reported in the Egyptian Soudan.

YELLOW FEVER.

During the year yellow fever was reported in various localities in South America and in a few localities in Africa; also in Mexico at Campeche, Carmen, Maxcanu, Merida, and Puerto Mexico, Vera Cruz In South America it was reported in Brazil in several localities. In Colombia it was reported at Cartagena. In Ecuador it occurred in several localities, also in Venezuela. In Cuba a case arrived at Habana on the steamer *Hydra*, which came from Manaos, Brazil, and touched at Para. Four deaths had occurred on the vessel en route, 2 at Manaos, 1 at Guantanamo, and 1 at Cienfuegos. One case also arrived at Cuba in the steamer *Morro Castle* in the person of a passenger from Campeche. Cases were also reported on the Island of Trinidad off the coast of South America.

In southern Nigeria it was reported at Forcados, Lagos, and Onitsha. In German East Africa it was reported at Lome in Togoland.

PLAGUE.

During the year plague continued its world prevalence and although there were no unusual outbreaks of importance it is quite probable that the infection spread to new localities. Plague during the last 20 years has been traveling to all corners of the earth, following the commercial routes, especially the water routes. Ships carry rats and rats carry plague, so that in the absence of special precautions to prevent the introduction of the disease in this way it would be surprising and quite accidental if ports of any size have escaped the infection.

In South America the disease has been reported in Argentina, Brazil, Chile, Ecuador, Peru, and Uruguay. It has undoubtedly occurred in other countries.

In Africa it was reported in British East Africa, in Egypt, in German East Africa, Morocco, and Tripoli.

In Asia it has been reported in Arabia, China, Dutch East Indies, India, Indo-China, Japan, Persia, Siam, the Straits Settlements, and in Turkey.

In Europe a case arrived at Trieste on a vessel from South America. Cases were reported in Greece at Athens and Piræus. The disease was also reported in several localities in Russia.

Cases were also reported in Australia at the Thursday Island quarantine station, where 5 cases were taken from the steamer *Layman* from Hongkong. One case was reported at Terceira in the Azores.

In Cuba a case was reported at Habana March 5, 1914. Between March 5 and the end of June, 25 cases had been reported at Habana, 1 case at Artemisa, and 1 at San Jose de las Lajas. Between June 30 and August 14, 10 cases were reported at Santiago and 4 cases in El Caney and vicinity.

PLAGUE IN THE UNITED STATES.

During the fiscal year 1914 from September 26, 1913, 39 plague-infected rats were found in the city of Seattle, Wash. In California plague-infected squirrels continue to be found in Contra Costa, Alameda, and Santa Clara Counties. There was a human case of plague in Contra Costa County at Martinez September 11, 1913.

On June 14, 1914, plague appeared in New Orleans and up to September 23 the finding of 128 plague-infected rats had been reported and also the occurrence of 28 cases of plague in man.

MARINE HOSPITALS AND RELIEF.

RELIEF STATIONS.

During the fiscal year 1914, the service operated 23 marine hospitals, all of which are owned by the Government, and maintained 120 other relief stations where hospital and dispensary relief was furnished patients. In order to furnish medical treatment to seamen in districts not heretofore provided for, relief stations were established during the year at Port Aransas, Tex., Gulfport, Miss., Reedville, Va., Burlington, Iowa, and Unalaska, Alaska.

RELIEF TO SEAMEN.

During the year 53,226 patients were treated at the various marine hospitals and relief stations of the service. Of this number 14,469 were treated in hospitals a total of 411,122 days, and 38,757 were treated at the dispensaries a total of 63,866 times. Within this period 466 seamen engaged on foreign vessels received hospital treatment a total of 6,664 days.

As provided by regulation, the accommodations made for the care and treatment of the patients of the service are also available to foreign seamen at relief stations of the first, second, and third class upon the application of the consular officer of the nation under whose flag they are sailing; or upon the application of the masters of the vessels upon which said seamen serve, provided satisfactory written security is given for the payment of the expenses of such care and treatment at the rate fixed by the department in the annual circular entitled "Contracts for the care of seamen, etc." The interesting point has been noticed, however, that at certain stations few or no foreign seamen have taken advantage of this privilege. A limited investigation of this matter shows that many captains of foreign vessels are not aware of the fact that their sailors may be admitted as patients of the service at the stations mentioned above, and that these captains make contracts with local practitioners to treat all sickness on board while in port at a stipulated sum. In view of these conditions, it would seem proper for the medical officers in charge of the various stations of the service to invite the attention of the shipping interest at their ports to the fact that a Government hospital, or contract relief station, is being maintained there for the express purpose of affording necessary medical treatment to seamen of the United States merchant marine, and also to seamen engaged upon foreign vessels upon the payment of certain fixed charges.

MARINE HOSPITALS.

By act of Congress approved March 4, 1911, the service is permitted to take into the marine hospitals special cases for the purpose of scientific study. This authority, if supported by a generous appropriation, will enable the service to make each marine hospital a public health center. A movement in this direction has already been inaugurated. The marine hospital at Mobile, Ala., is being made a center for studies on malaria; the marine hospital at Savannah, Ga., is being utilized in connection with the investigation of pellagra; and the marine hospital at Wilmington, N. C., is a center for school inspection and for the study of parasitic diseases. A healthy extension of this plan should enable the marine hospitals to play a double rôle of considerable importance.

From an administrative point of view, the congressional provision which prevents an increase in salary of an employee of the Government over that of the previous year without an act of Congress, unless the services of the employee have been definitely changed, is working to the disadvantage of marine hospitals inasmuch as it prevents, practically, a financial recognition of increased efficiency, and therefore makes it difficult in many instances to retain an efficient class of attendant labor. Handicapped by the provision mentioned, it is necessary to begin a novice at a wage that he does not earn and to lose his services after he becomes sufficiently efficient to be of value to another hospital.

RELIEF TO NATIVES OF ALASKA.

Medical officers of the service detailed for duty on board vessels of the United States Revenue-Cutter Service cruising in northern waters furnished all possible medical relief to the natives inhabiting both the mainland and the neighboring islands of Alaska. Owing to the short stay of a vessel at any one point, the study of diseases, their causes, and the treatment of patients could not be properly made. Nevertheless, a great deal of medical relief was afforded the natives of Alaska at points visited. It seems to be a pressing necessity that the Government take steps to provide hospital and dispensary treatment to these natives, not only for the sake of relieving distress, but also with the view of preventing their ultimate extinction.

Asst. Surg. T. C. Galloway, jr., attached to the revenue cutter *Unalga* during the Alaskan cruise of 1914, states as follows relative to the life, sanitary conditions, and diseases common to the natives of this country:

HEALTH CONDITIONS AMONG THE ALEUTS.

It is estimated that at the coming of the Russians in the last of the eighteenth century, the natives of the Aleutian chain and of the Pribilof Islands numbered well over 8,000. Now the total of their descendants is a little over 800. The village of Atka, whose 78 inhabitants were reduced last year to 64 by a variety of diseases, represent the remnant of three villages which numbered 15 years ago about 700 people.

Dr. Esmond, who lives among the natives of St. Paul Island, estimates that 75 per cent of them have open tuberculosis. A large majority of the chests which I examined had active lesions of this disease, and residents of the villages state that nearly every native has a chronic cough.

Although the limited time which we spent at the different villages hardly permitted an intensive study, I have tried to discover the causes of the great incidence of disease and the high mortality among these natives, and to consider a possible remedy.

The Aleuts were described by the first Russians who saw them as a sturdy, warlike people. It may be supposed that their isolation had protected them, at the cost of any acquired immunity, from the infectious diseases to which they so easily succumbed on their introduction later. Father Veniaminof, the Russian priest, who seems to have been an accurate historian of these people, states that smallpox in 1838 and 1839 carried off one-half the population. Measles in 1874, 1875, 1910, and 1913 had an even higher mortality in those villages where it occurred. Syphilis, at its introduction in 1798, was epidemic and attacked whole families and villages with serious results.

Aside, however, from any question of acquired immunity, the living conditions of the natives are such as to make them easy prey to disease. The climate is foggy and damp, the sun is hidden most of the time, and high winds are very frequent. In such a climate, with trees lacking, the "barabara" was the natural development. These dwellings are half cave, sod covered, usually damp, dark, and airless. Only recently do some of them have wood floors and walls. Since fuel is almost lacking, warmth is conserved at the expense of ventilation. The cooking is done at one end of these huts over an open fire. Their restricted diet consists chiefly of the product of their hunting, with some flour, tea, and sugar secured from the traders. They are fatalistic and improvident, and live in alternate surfeit and famine.

With the falling off in numbers and their relative village isolation, inbreeding has probably helped to produce a weak stock. With fertile soil thus prepared for disease, the personal habits of the natives provide the necessary vehicle for its transmission.

Sanitary sense has hardly begun to develop in the Aleut, although teachers, missionaries, and others have instilled some fear of tubercular discharges. It is quite common, however, to see a mother in far-advanced diseases fondling her still healthy infant and bestowing on it her baneful caresses. The frequent practice of mothers of masticating dried fish before giving it to their weaning babies must work great harm. The sick room is always crowded with curious neighbors, which probably helps in the rapid spread of epidemics. Superstitious and childlike, the natives do not lend themselves readily to improvement in the present situation, yet unless improvement comes quickly, extinction is almost inevitable in a comparatively few years.

The treatment and instruction which officers of the Public Health Service on duty with revenue cutters can give is almost negligible. Only a limited time can be spent in each village, the natives have to be treated almost against their will, and are seen usually but once or twice a year.

PHYSICAL EXAMINATIONS.

The medical officers of the service made 7,983 physical examinations during the year, as noted under the special headings given below. These examinations were made of applicants for original or renewal of license as master, mate, or pilot; applicants desiring to enter or already engaged in the various branches of the Government service; examinations made of American seamen, foreign seamen, and persons contemplating service in the Philippine Islands and in the Panama Canal Zone.

Steamboat-Inspection Service.—Three thousand five hundred and forty-nine pilots were examined as to visual capacity, of which number 92 were rejected.

Merchant seamen of the United States.—Physical examinations were made of 941 American seamen, of which number 29 were rejected.

Revenue-Cutter Service.—One thousand three hundred and seventy-two men were examined, of which number 215 were rejected.

Life-Saving Service.—One thousand five hundred and fourteen keepers and surfmen were physically examined, of which number 66 were rejected.

Five hundred and eighty-five disability certificates referred to this bureau by the general superintendent of the Life-Saving Service were passed upon. These called for an expression of opinion on the medical evidence submitted in claims for benefits under the act of Congress approved May 4, 1882; upon the physical fitness of keepers and surfmen for enlistment, promotion, and retention; and upon evidences of death submitted by widows or orphans in their claims for benefits.

The services of 21 acting assistant surgeons were continued during the year for the physical examinations of keepers and surfmen at points not easily accessible to regular officers at stations of the service. In addition, three medical officers were detailed at the request of the general superintendent to points along the Atlantic coast to examine candidates for enlistment.

Coast and Geodetic Survey.—One hundred and eight employees and applicants for appointment were examined, of which number 5 were rejected.

Lighthouse Service.—Fifty-one applicants for enlistment were examined, of which number 2 were rejected.

Foreign seamen.—Six foreign seamen were examined as to physical fitness for duty, of which number 1 was rejected.

Immigration Service.—Two hundred and forty-one persons connected with the Immigration Service were physically examined, of which number 18 were rejected.

Civil Service Commission.—One hundred and eighty applicants for appointment to the Government service were examined, of which number 10 were rejected.

Isthmian Canal Commission.—Five employees and applicants for appointment were examined, of whom none was rejected.

Philippine Islands.—Physical examinations were made of 16 applicants to serve in the islands, of which number none was rejected.

PURVEYING DEPOT.

The following statistics show the transactions of the purveying depot during the fiscal year:

SUPPLIES PURCHASED.

Drugs and chemicals	$17,921.88
Surgical instruments and appliances	12,203.43
Beds, bedding, etc	10,820.01
Dry goods	5,781.53
Pharmacal implements, etc	2,472.18
Rubber goods	1,669.79
Books and journals	1,476.38
Alcohol, wines, etc	912.84
Flags	906.35
Packing boxes and sawdust	287.64
Bacteriological supplies, etc	702.15
Electric lamps, etc	1,125.21
Kitchen utensils and tableware	222.10
Miscellaneous	1,128.90
Total	57,630.39

CREDIT.

By bills paid direct from funds:		
Quarantine service	$3,753.75	
Maintenance	957.82	
Care of seamen	1,287.43	
Bureau	262.63	
Epidemic fund	98.40	
Field investigations	1,415.39	
Interstate quarantine	8.00	
Furniture	140.37	
		7,923.79
Total		49,706.60
By amounts reimbursed from other appropriations for supplies issued from stock:		
Quarantine service	2,842.56	
Epidemic fund	1,570.19	
Field investigations fund	297.77	
		4,710.52
Net expenditures chargeable to appropriation for purveying depot (in amount $45,000)		44,996.08
Salaries	5,976.77	
Operating expenses	190.69	
		6,167.46
Total net expenditures		51,163.54

Number of requisitions filled	505
Number of packages shipped from depot	2,047
Total weight of supplies shipped from depot (pounds)	166,917
Number of orders for supplies shipped direct by contractors	161
Total weight of supplies shipped direct to stations by contractors (pounds)	123,019

Tuberculosis Sanatorium, Fort Stanton, N. Mex.

A REPORT FOR THE YEAR ENDED JUNE 30, 1914, OF THE SANATORIUM MAINTAINED BY THE PUBLIC HEALTH SERVICE FOR THE TREATMENT OF TUBERCULOUS PATIENTS.

[By F. C. Smith, passed assistant surgeon, United States Public Health Service.]

GENERAL INFORMATION.

Patients present July 1, 1913	146
Patients admitted during the year	182
Total treated during year	328
Patients discharged during the year	142
Deaths (included in preceding item)	56
Bodies interred in sanatorium cemetery	55
Patients present June 30, 1914	186
Minimum number of patients during the year (July 3, 1913)	144
Maximum number of patients during the year (Mar. 13, 1914)	213
Total days' treatment furnished patients	67,760
Officers and attendants	90
Patients who left against advice	25
Patients readmitted	17
Patients discharged for causes affecting discipline	5
Patients transferred to other stations, 1 dyspnea, 1 asthma	2
Physical examinations during year	1,057

Average duration of stay of patients discharged, 10 months 25 days.
Minimum stay, 1 day.
Maximum stay, 8 years and 9 days.

Patients discharged during the year, with stage of disease and result of treatment.

	Apparently cured.	Arrested.	Improved.	Not improved.	Died.	Total.
Incipient	9	6	1	1	1	18
Moderately advanced	1	10	6	3	3	23
Far advanced	1	12	15	19	52	99
Nontuberculous						2
Total	11	28	22	23	56	142

Period of detention of the 56 who died, included in the above summary.

Over 2 years	8
Between 1 and 2 years	9
Between 6 and 12 months	7
Between 3 and 6 months	8
Between 1 and 3 months	15
Under 1 month	9

Prognosis on arrival.

Favorable	33
Favorable for arrest	42
Favorable for prolongation of life by living under proper conditions	13
Unfavorable	51
Doubtful	2
Nontuberculous	1
	142

As in previous years more than two-thirds of the cases treated are far advanced and only a few incipient. The large number of deaths is due in part to the policy of encouraging those hopelessly sick to remain.

CAUSE OF DEATH.

Fifty-six patients died during the year. Thirty-two autopsies were held. The causes of death were as follows:

Tuberculosis of lungs, uncomplicated except by the usual terminal degenerative changes of viscera		[1] 35
Tuberculosis of lungs and pulmonary hemorrhage:		
Sudden death	1	
Broncho-pneumonia	1	
Dilatation of heart	2	
		4
Tuberculosis of lungs and intestines		[2] 2
Tuberculosis of lungs and meninges		[3] 3
Tuberculosis of lungs and larynx		5
Tuberculosis of lungs with nephritis		[4] 3
Tuberculosis of lungs and acute dilatation of heart		[5] 2
Tuberculosis of lungs and carcinoma of stomach with metastasis		1
Tuberculosis of lungs and exposure to cold while drunk		[6] 1

DENTAL WORK.

A dentist has been on duty for about four months and gave valuable assistance. Among other items of institutional work rendered without charge to patients were 273 fillings, 100 extractions, and 142 other treatments for various dental ailments. The dentist's position carries no salary and it is difficult to keep the place filled.

TREATMENT.

The usual sanatorium regimen has been observed, the most important item of which is the regulation of rest and exercise. An unusually large number of bedfast cases has been present, the daily average for the year being 34. This has taxed the capacity of the infirmary building and the efforts of the infirmary personnel.

AMUSEMENTS.

Patients and attendants through their amusement association have continued to operate a weekly moving-picture show of four films. The baseball team is financed by the same organization. All entertainments are free to patients and are without expense to the Government. A successful Fourth of July picnic and barbecue, in which several hundred people from the neighboring ranches participated with the patients, was arranged by the same organization.

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[1] One died suddenly, syncope; immediate cause of death undetermined.
[2] One died of hemorrhage from bowels.
[3] One was being treated by induced pneumothorax.
[4] One fatty degeneration of kidneys; tuberculosis healed.
[5] One attributed to treatment by induced pneumothorax; one resulted from chronic myocarditis.
[6] Tuberculosis healed.

Statement of receipts and expenditures of marine-hospital amusement association for the fiscal year 1913–14.[1]

RECEIPTS.		DISBURSEMENTS.	
Balance brought forward	$156.57	Film rental	$390.00
Donations	779.00	Improvements	107.03
Grand-stand receipts	73.90	Express	189.09
Sale of calendars, sacks, egg cases, barrels, etc	131.18	Baseball	247.30
Receipts from picnic stands	443.95	Repairs	22.38
		Postage	4.72
		Miscellaneous	48.80
		Telegrams	3.25
		Picnic	380.87
		Balance carried forward	193.16
	1,584.60		1,584.60

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[1] Prepared by C. U. Babbs, secretary.

LIBRARY.

During the year 163 bound volumes were added to the library, which now contains 3,082 books and receives, without expense to the Government, 60 periodicals and 2 daily papers. Books and periodicals were drawn to the number of 13,185, of which 11,357 were for patients.

RELIGIOUS SERVICES.

Nonsectarian services were held each Sunday by the chaplain who also conducted religious exercises at each interment in the sanitarium cemetery.

GRADUATED EXERCISE AND PATIENTS' EARNINGS.

Selected cases after at least two months' observation are given therapeutic exercise, usually in one-hour daily periods.

Total number of patients working on exercise squads	87
Total hours of work, exercise	4,886

The principal items included in the above are:

	Hours.
Passing wood to power saw	1,320
Hauling stove wood with horse and wagon	792
Garden work	156
Carrying trays in hospital	364
Cleaning in hospital wards	294
Preparing vegetables, splitting kindling, painting, cleaning grounds, etc	1,960

Prescribed exercises may be taken in walking if the patient chooses, but none declining work with the exercise squads is eligible for positions carrying remuneration. Remunerative positions are obtainable to all approaching fitness for discharge. Sixty-one patients worked for 30 days or more as attendants. The amount earned by patients on the pay roll as attendants was $8,392.67. Many are employed after recovery and the amount earned by expatients on the pay roll was $3,253.83. Private enterprise is encouraged and 82 earned money in this way.

All ambulatory patients live in tent houses, of which there are 90, each usually occupied by two patients who are required to keep their quarters clean and make their own beds. This work, which is exacted in addition to all other exercise prescribed, is therefore the minimum required from all patients whose physical condition admits their discharge from the infirmary building.

Earnings by private enterprise.

Occupation.	Number of patients employed during year.	Aggregate of hours.	Approximate amount earned.
Clerk in store	3	2,548	$360
Clerk in post office	2	1,456	120
Shoemaker	5	936	180
Barber	2	1,872	420
Hostler	4	1,040	120
Cook	1	246	75
Waiter and scullion	11	4,576	480
Other domestics (strikers)	40	10,395	1,050
Miscellaneous employment, including photography, cleaning clothes, polishing shoes, attending pool table, trapping, etc	14	5,040	1,102
Total	82	28,109	3,907

In all, $15,553.50 were earned during the year at the institution by patients or ex-patients. The benefit of work both paid and unpaid at this isolated institution can hardly be overestimated. The long average duration of treatment attained is largely attributable to the opportunities provided for employment, but no great saving is effected for the institution.

Passed Asst. Surg. F. H. McKeon, who has charge of all ambulatory patients, regulates their activities, the benefit of which always depends on careful observation of clinical symptoms.

WATER SUPPLY.

All water for domestic purposes has been pumped from the station wells during the year. This water is not satisfactory for domestic purposes on account of its hardness. Pumping is expensive with our present equipment, and there is danger that the station will become confirmed in unwise habits of economy in the use of water. Water rights are still in litigation, and it has become necessary for the station to prove its claims to all water used for domestic and other purposes. The uncertainty of the outcome is delaying decision concerning new construction and major repairs.

COST OF MAINTENANCE.

A total of $122,828.18 was spent. The gross cost of each day's treatment per patient was $1.7774 and the net cost $1.7348. The cost of the daily ration purchased was $0.3357. Including station products at market prices the cost of the daily ration was $0.6890.

Items of expenditure.[1]

		Per annum.	Per patient per day.
Salaries only:			
Medical officers		$8,340.22	$0.1216
Pharmacists and office force		3,578.30	.0528
Power plant		2,806.67	.0414
Carpenters, plumbers, and painters		2,834.00	.0418
Nursing		3,403.00	.0520
Cooks and waiters		6,014.33	.0886
Laundry		1,320.00	.0195
Range herd		2,820.00	.0415
Dairy		2,013.67	.0297
General		2,401.33	.0354
Farm		5,788.00	.0854
Total		41,219.52	.6097
Material and supplies:			
Subsistence supplies		33,346.22	.4921
Dispensary		737.59	.0109
Kitchen		1,047.47	.0154
Fuel (wood furnished to tents, quarters, etc., and gasoline for operating wood saw)		5,976.17	.0881
Laundry		578.74	.0085
Miscellaneous		2,193.67	.0324
Power plant (coal and miscellaneous supplies)		12,650.73	.1867
Dairy		254.27	.0037
Range (including gasoline for well-drilling operations)		3,544.09	.0523
Forage		11,642.44	.1718
Farm		1,107.87	.0163
Repairs and preservation of public buildings		4,855.79	.0716
Mechanical equipment for public buildings		1,216.16	.0179
		81,608.66	1.1677
Salaries		41,219.52	.6097
Total expenditures		122,828.18	1.774
Refund from reimbursement from officers and attendants for subsistence supplies	$1,408.80		
Realized from sale of beef hides	1,472.14		
Realized from sale of excess dairy calves	3.10		
		2,884.04	.0426
Net expenditures		119,944.14	1.7343

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[1] Prepared by H. D. Leech, pharmacist.

NOTE.—Salaries of consulting engineer and hydrographer on water investigation not included in above.

The cost of repairs all of which are made by the station force, was considerable, owing to the large number of buildings—32, all of which are old.

Over 4,000 gallons of soft soap were made from waste grease and a saving of $286.77 effected over the average cost of soap in previous years. Sawdust and other rubbish were burned at the power plant during the month of June, the supply of coal being exhausted.

The large number of bed-fast patients increases our cost of maintenance. The cost of nursing a daily average of 34 infirmary patients was $3,497.70 for the year, or $0.2293 per capita per day against $423.75 and $0.0079, respectively, for nursing 151 ambulant patients. The cost of laundry for the infirmary patients was $0.0422 per day against $0.0251 for the others. The cost of burying 55 bodies, counting labor and material was $435.90.

A list of 53 representative sanatoria and their respective costs of maintenance was published in last year's annual report from this institution. Reprint No. 145 from the Public Health Reports.

FARM AND HERD.

All the beef and milk used were produced on the station.

The prices fixed for these articles—15 cents a pound and 35 cents a gallon, respectively—are probably too low, considering the fact that the beef is chiefly from corn-fed steers hung in storage from four to six weeks and the milk is bottled and from a tuberculin-tested purebred Jersey herd. The contract price quoted for eggs is also less than the station-produced eggs are worth.

The threatened famine on the range, mentioned in last year's report, necessitated the pasturing of 1,000 cattle, approximately one-half the herd, on the Mescalero Indian Reservation, at the usual grazing rates charged by the Indian Service. A permanent camp was established there, with two attendants in charge, and though the expense of maintaining the range herd was materially increased the losses from starvation were less than in previous years.

About 2½ miles of new fence were built, adding several hundred acres of grazing land to the range. As heretofore, the farm force has assisted in many emergencies incident to sanatorium management. The farm account shows a considerable profit to the institution for the year.

Statement of farm account.

Dr.		Cr.	
Salaries and rations, including expert farmer, farm hands, dairymen, and fence riders	$13,277.78	Beef, 108,658 pounds, at 15 cents per pound (market price)	$16,013.70
Repair materials, farm machinery, dairy equipment, and range material	2,226.23	Pork, 4,633 pounds, at 15 cents per pound (contract price)	694.95
One Jersey bull	125.00	Eggs, 1,697 dozen, at 26 cents per dozen (contract price)	441.22
Eighteen range bulls	2,555.00	Milk, 38,983 gallons, at 35 cents per gallon (market price)	13,644.05
Forage purchased	11,642.44	Green corn, 2,083 pounds, at 4.32 cents per pound	90.00
Profit	6,780.87	Lettuce, 722 pounds, at 12 cents per pound (contract price)	86.64
		Onions, 10,484 pounds, at 5 cents per pound (contract price)	524.20
		Apples, 4,306 pounds, at 1.59 cents per pound (contract price)	68.47
		Other vegetables, 6,887 pounds, at 5 cents per pound	344.35
		Excess Jersey calves sold	3.10
		Beef hides sold	1,472.14
		Alfalfa, 177.5 tons, at $13 per ton (contract price)	2,307.50
		Ensilage, 60 tons, at $5 per ton (arbitrary price)	300.00
		Labor loaned sanatorium	617.00
	36,607.32		36,607.32

NOTE.—Alfalfa and ensilage, while given as a farm credit, were consumed in the production of milk and beef.

PERSONNEL.

COMMISSIONED MEDICAL OFFICERS.

At the commencement of the fiscal year, July 1, 1913, the commissioned corps consisted of the Surgeon General, 10 senior surgeons, 63 surgeons, 40 passed assistant surgeons, and 30 assistant surgeons.

The sundry civil act, approved June 23, 1913, provided an appropriation of $50,000 for additional assistant surgeons. Under this appropriation 23 additional assistant surgeons were appointed between July 12, 1913, and February 24, 1914.

The changes during the fiscal year were as follows: Three passed assistant surgeons were promoted to the grade of surgeon, 6 assistant surgeons to the grade of passed assistant surgeon, and 23 candidates who passed the examination required by the laws and regulations of the service were commissioned assistant surgeons. On account of physical disability 2 surgeons and 1 passed assistant surgeon continued on waiting orders.

At the close of the fiscal year the commissioned medical corps consisted of the Surgeon General, 10 senior surgeons, 66 surgeons, 43 passed assistant surgeons, and 47 assistant surgeons. One senior surgeon, 3 surgeons, and 2 passed assistant surgeons were upon detail in the bureau as assistant surgeons general, in accordance with the act approved July 1, 1902.

Assignments.—Among other assignments of commissioned medical officers during the fiscal year were the following: Thirty-three were assigned to exclusive immigration duty, their services being supplemented by employment of acting assistant surgeons; 7 to the quarantine service of the Philippine Islands; 9 to vessels of the Revenue-Cutter Service; 14 to the quarantine stations in the continental United States, Porto Rico, and the Hawaiian Islands; 4 to duty in foreign countries to prevent the introduction of epidemic diseases into the United States.

Special details.—Passed Asst. Surg. M. C. Guthrie was detailed as chief quarantine officer of the Canal Zone. Passed Asst. Surg. V. G. Heiser, in addition to his duties as chief quarantine officer, has been continued as director of health of the Philippine Islands. Upon the request of the Commissioner of Education, Department of the Interior, Passed Asst. Surg. Emil Krulish has been continued for duty in Alaska for the improvement of the sanitary and social conditions of the natives.

Field investigations of public health.—In accordance with the act of Congress approved August 14, 1912, authorizing the service to study and investigate the diseases of man and conditions influencing the propagation and spread thereof—including sanitation and sewage and the pollution either directly or indirectly of the navigable streams and lakes of the United States—the following officers and corps of special assistants were detailed to make these special investigations:

Rural sanitation, with special reference to typhoid fever: Surg. L. L. Lumsden, in charge, Passed Asst. Surgs. W. M. Bryan and R. M.

Grimm, Asst. Surg. J. B. Laughlin, Acting Asst. Surgs. T. F. Keating, H. C. Yarbrough, and R. E. Wynne, and Epidemiologists D. B. Lowe, F. E. Harrington, and W. K. Sharp, jr.

Rural sanitation, with special reference to malaria: Senior Surg. H. R. Carter, Surg. R. H. von Ezdorf, Asst. Surgs. R. C. Derivaux and T. J. Liddell, Sanitary Engineer J. A. A. Le Prince, and Tech. Assts. H. A. Taylor and D. M. Molloy.

Pellagra: Surg. Jos. Goldberger, in charge; Surg. E. Francis, Passed Asst. Surgs. R. A. Herring and J. R. Ridlon, Biochemist Andrew Hunter, Special Expert W. F. Lorenz and Mathilde Koch, Tech. Asst. D. G. Willetts, Organic Chemist C. N. Myers, Acting Asst. Surgs. C. H. Waring and A. B. Cleborne, and Internes B. H. Sanchez and M. E. Perkins.

Prevention of trachoma: Surg John McMullen, in charge; Acting Asst. Surgs. R. W. Raynor, J. C. Johnston, and T. F. Wickliffe, and Pharmacist Chas. G. Carlton.

Rocky Mountain spotted fever in Montana: Surg. L. D. Fricks, in charge.

Pollution of the Ohio River: Passed Asst. Surg. W. H. Frost, in charge, and Passed Asst. Surg. Paul Preble, Asst. Surgs. L. R. Thompson, M. H. Neill, and Liston Paine, Sanitary Engineers J. K. Hoskins, R. E. Tarbett, and H. W. Streeter, Sanitary Bacteriologists H. M. Campbell, Max Levine, E. M. Meyer, C. M. Sherwood, J. W. McBurney, A. M. Besemer, W. E. Brown, E. E. Smith, 2d., and H. B. Corbitt, and Plankton Expert W. C. Purdy.

Pollution of coastal waters: Surg. H. S. Cumming, in charge; Asst. Surg. W. F. Draper, Sanitary Engineer H. P. Letton, Sanitary Chemist W. F. Wells, and Sanitary Bacteriologist H. V. Stewart.

Sewage disposal: Sanitary Engineer L. C. Frank, and Sanitary Bacteriologist C. P. Rhynus.

Industrial wastes: Sanitary Chemists H. B. Hommon and H. C. Colson, and Sanitary Bacteriologist H. L. Shoub.

Sanitary organization and administration: Surg. C. Fox, in Minnesota, and Passed Asst Surg. R. H. Creel in Illinois.

School hygiene: Surg. T. Clark, in charge, Passed Asst. Surg. A. D. Foster.

School hygiene: Prof. C. W. Stiles, in charge; Acting Asst. Surgs. G. A. Wheeler, C. A. Downs, J. J. S. Schmitt, C. E. Connor, F. Grave, and A. G. Fechtig, and Tech. Asst. H. M. Slater.

Industrial hygiene: Surg. J. W. Schereschewsky, in charge; Passed Asst. Surgs. F. Simpson and R. Olesen, Acting Asst. Surgs. W. H. Sheldon, Frances Shostac, Ebba A. Dederer, and Eva Cohnheim, Asst. Physicist Davis H. Tuck, Sanitary Chemist C. Weisman, and Interpreters Harry Kleinman and Anna Poringer.

Sanitation of metallurgical plants: Asst. Surg. J. A. Watkins, in charge.

Mine sanitation: Passed Asst. Surg. A. J. Lanza.

Industrial hygiene, under Commission on Industrial Relations: Surg. B. S. Warren.

Tuberculosis in Cincinnati industries: Surg. D. E. Robinson, in charge, and Special Experts H. Freudenberger and W. J. Topmoeller.

Tuberculosis in interstate traffic: Surg. P. M. Carrington and Passed Asst. Surg. E. A. Sweet.

Plague eradicative measures.—California: One surgeon, 1 passed assistant surgeon, and 1 assistant surgeon remained upon this duty in San Francisco and vicinity.

Washington: One surgeon and 1 assistant surgeon are upon similar duty in Seattle and vicinity.

Louisiana: Upon the report of the presence of plague in New Orleans the Surgeon General personally organized the plan of campaign with the State and local health authorities for rodent extermination, detailing Asst. Surg. Gen. W. C. Rucker in immediate charge. Surg. G. M. Corput was detailed to take charge of the sanitation of outgoing vessels for river, coastwise, and foreign ports.

Personnel, Hygienic Laboratory.—At the close of the fiscal year there were on duty in the Hygienic Laboratory, in addition to the director and assistant director, 3 chiefs of divisions, 8 surgeons, 9 passed assistant surgeons, 2 assistant surgeons, 2 pharmacists, 1 artist, 6 technical assistants, and 33 attendants.

Quarantine inspector.—One quarantine inspector served throughout the entire year.

Acting assistant surgeons.—The services of 15 acting assistant surgeons have been discontinued during the fiscal year, 3 have died, and 31 have been appointed, leaving on duty at the end of the fiscal year 239 such officers.

Medical inspectors.—One female inspector served during the entire year for the inspection of women passengers at Honolulu, Hawaii.

Internes.—At the beginning of the fiscal year there were 15 internes on duty at the various marine-hospital stations; 18 were appointed and 14 were separated from the service by reason of resignation, leaving 19 on duty at the close of the fiscal year.

Pharmacists.—At the beginning of the fiscal year there were on duty 46 pharmacists, divided as follows: Pharmacists of the first class, 16; second class, 24; third class, 6. One pharmacist of the second class and 2 pharmacists of the third class resigned; 1 pharmacist of the third class was appointed, 2 pharmacists of the second class reinstated, and 8 pharmacists of the second class were promoted, leaving at the close of the fiscal year 46 pharmacists on duty, as follows: Pharmacists of the first class, 24; second class, 17; third class, 5.

Pilots and marine engineers.—At the beginning of the fiscal year there were on duty 15 pilots and 21 engineers; 1 pilot was appointed; 5 marine engineers resigned, and 4 were appointed. The number on duty at the close of the fiscal year were as follows: Pilots 16; marine engineers, 20.

Hospital and quarantine attendants.—At the beginning of the fiscal year 1,028 attendants were employed at the various marine hospitals, quarantine stations, and on epidemic duty, including 70 such employees on duty in the Philippine Islands, and at the close of the fiscal year there were so employed as follows:

Marine hospitals	598
Quarantine (including Porto Rico and Hawaii)	240
Epidemic	96
Field investigations of public health	65
	999
Philippine Islands	65
Total	1,064

RECAPITULATION.

Commissioned medical officers		167
Chiefs of divisions, Hygienic Laboratory		3
Artist		1
Technical assistants		6
Quarantine inspector		1
Acting assistant surgeons		239
Medical inspector		1
Internes		19
Pharmacists		46
Pilots		16
Marine engineers		20
Expert farmer		1
Trained nurses		2
Attendants		1,064
Field investigations:		
Acting assistant surgeons	18	
Biochemist	1	
Sanitary engineers	6	
Organic chemist	1	
Sanitary chemists	4	
Sanitary bacteriologists	12	
Epidemiologists	3	
Special experts	4	
Plankton expert	1	
Assistant physicist	1	
Technical assistants	4	
Internes	2	
Interpreters	2	
		59
Total		1,645

Boards Convened.

Twenty boards were convened at different times and at various stations through the United States for the physical examination of officers of the Revenue-Cutter Service and applicants for entrance therein; 17 for the physical examination of detained aliens; 12 for the examination of commissioned officers to determine their fitness for promotion to the next higher grades of the service; 37 for examination of applicants for appointment as assistant surgeons, and 12 for the examination of pharmacists to determine their fitness for promotion to a higher grade.

Boards were convened for the preparation of a manual for the mental examination of immigrants, for the revision of the bureau telegraph code, and for continuing the work of preparing a revised nomenclature of diseases.

The bureau sanitary board has been convened in 13 sessions to pass upon reports of inspections of establishments engaged in the manufacture of vaccines, serums, toxins, etc., prior to recommending a license, and to pass upon advertised remedies and appliances to determine if said advertisements should be excluded from the mails.

Two boards were convened, under paragraph 56 of the service regulations, for the physical examination of officers of the service.

PUBLICATIONS.

During the past year the Public Health Service distributed nearly three times as many copies as during any year preceding, the total being 1,487,015, as compared with 555,087 for the previous year. In the course of the year the service published 111 different bulletins and pamphlets on health subjects, in addition to the weekly issues of the Public Health Reports. Many of the editions were quickly exhausted, and as a consequence a large number of copies were sold by the Public Printer at nominal prices. The total expense of printing publications for the bureau during the year was $47,265.21.

On account of the limited appropriation available, the editions were necessarily small, and the bureau was obliged to decline many applications on account of the supplies being exhausted.

The service is giving special attention to the preparation of health literature of a popular character, and is endeavoring to get this literature into the hands of persons who will put it to practical use. The education of families and individuals in the known means of preventing disease and upbuilding bodily vigor is a most effective way of promoting the public health. The increasing demand for publications shows that the average person is eager to learn

The requests for publications covered a very wide range of subjects pertaining to sanitation and health, and the bureau is pursuing a comprehensive plan whereby it will ultimately have available for distribution popular bulletins and pamphlets on every subject of interest to the average citizen in his efforts to improve health and sanitary conditions. For instance, there are now projected or in course of preparation bulletins on the following topics:

First aid to the sick and injured.
Sanitation of dwellings, including ventilation, humidity, plumbing, etc.
Sewage disposal and sewage disposal systems.
Cesspools and septic tanks.
Sanitation of street cars and public places.
Conservation of vision.
Public comfort stations.
Monthly list of publications.

The service publications fall into two general classes. The first, of a scientific or technical nature, are usually issued as bulletins of the Hygienic Laboratory. These are not ordinarily for general distribution, but are sent to libraries, scientists, physicians, and others engaged in work of a similar or related character. The second class, of a more popular type, are designed for the general public, and, in some cases, for the special information and instruction of health officials and other public authorities throughout the country. To obtain the largest results, these documents should be printed in much larger editions and made available to every citizen who can use them. The result would be immensely profitable to the nation in the improvement of sanitary conditions and the conservation of health. The present necessity of small editions of these bulletins and pamphlets restricts their effectiveness to a very unfortunate extent. It is of interest to note, in this connection, that the Department of Agriculture issued over 33,000,000 copies of publications in 1913, as compared with 1,487,015 health publications sent out by the Public Health Service in the past year.

The general character of the publications issued during the past year will be seen from the following list, arranged by classes:

ANNUAL REPORTS.

This report contains a summary of the transactions of the service in its several widely varied fields of activity.

HYGIENIC LABORATORY BULLETINS.

90. **Epidemic Studies of Acute Anterior Poliomyelitis.**—I. Poliomyelitis in Iowa, 1910. II. Poliomyelitis in Cincinnati, Ohio, 1911. III. Poliomyelitis in Buffalo and Batavia, N. Y., 1912. By Wade H. Frost.

The studies comprised in this report have been carried out covering a period of three consecutive years. While each epidemic is a complete study in itself, the three combined give a unity of presentation, very desirable for comparative observations.

Owing to the large number of cases studied, and the wide distribution under varying conditions in which the epidemics occurred, the bulletin represents an extremely important contribution to the literature on infantile paralysis.

91. **I. The Cause of Death from Subdural Injections of Serum.** By Worth Hale. **II. Some New Cholera Selective Media.** By Joseph Goldberger.

The first article in the bulletin contains the results of work done with reference to the untoward symptoms and occasional deaths that follow the subdural injection of antimeningitis serum. Quite a number of such cases have been reported in medical literature. About a year ago Dr. Kramer, of Cincinnati, advanced the hypothesis that these cases of sudden death were due to the presence in the serum of a poisonous preservative, viz, tricresol. This statement was of such importance that it was deemed wise to have the studies made by Dr. Hale, the author.

The author has demonstrated that intraspinal injection of serum containing no preservatives produced no symptoms aside from those which have been ascribed to increased intracranial tension and that death follows from respiratory failure. In such cases there always is an enormous rise in blood pressure which, after rising to a considerable degree, rapidly falls to zero. But the intracranial injection of serum containing tricresol, in addition to the failing respiration, is attended with a marked fall in blood pressure. Further than this, it is found that serum containing tricresol is vastly more fatal than the same serum free from preservative.

The second paper contains the results of a large number of experiments to test out the value of a certain selective medium that has been proposed for use in the isolation of the cholera vibrio. The author has found that, by the use of a special medium composed of alkaline-meat-infusion, and a special egg medium, the cholera vibrio is much more easily and certainly isolated from feces to which the cholera vibrio had been added than without the use of these cultural methods.

92. **Gaseous Impurities in the Air of Railway Tunnels.** By Atherton Seidell and Philip W. Meserve.

The work described in this bulletin was undertaken for the purpose of ascertaining whether the smoke-laden atmosphere of tunnels through which coal-burning locomotives pass contained amounts of poisonous gases which could be considered dangerous to health.

93. **Digest of Comments on the Pharmacopœia of the United States of America** (Eighth Decennial Revision) and of the National Formulary (Third Edition) for the year ending December 31, 1912. By Murray Galt Motter and Martin I. Wilbert.

This represents the eighth volume of the present series of digests and comments on the pharmacopœia and includes a review of the medical and pharmaceutical literature for the year ending December 31, 1912. As a comprehensive index of literature relating to official drugs, these bulletins are receiving recognition both in this country and abroad.

It is generally recognized that the compilation of comments on the several official articles in the form of the digest published by this service has done much to bring about a proper appreciation of the need for securing greater uniformity in the purity and strength of widely used medicines.

94. **I. Collected Studies on the Insect Transmission of Trypanosoma Evansi.** By M. Bruin Mitzmain. II. Summary of Experiments in the Transmission of Anthrax by Biting Flies. By M. Bruin Mitzmain.

This bulletin treats of the insect transmission of trypanosomiasis and anthrax by insects. The first paper shows the possibility of the transmission of certain forms of trypanosomiasis by the bite of tabanid flies, not only to horses and other animals, but to man.

The second article contains a summary of experiments in the transmission of anthrax by certain biting flies. It has been known for a long period that persons handling hides and carcasses of animals dying of anthrax, or persons engaged in the sorting of wool from dead animals, may contract anthrax. The bulletin shows that anthrax may be transmitted from animal to animal by the bite of certain flies and doubtless also in the same manner to man.

95. **Laboratory Studies on Tetanus.** By Edward Francis.

I. Conditions surrounding tetanus spores artificially implanted into vaccine virus.
II. The behavior of tetanus spores injected subcutaneously into guinea pigs and white mice.
III. Miscellaneous observations upon tetanus.

The author gives the results of his studies continued over a long period in regard to the search for the tetanus organism in vaccine virus, all of which were negative. The results of his studies finally enabled him to recommend a standard procedure for the bacteriological testing of vaccine virus for the tetanus organism and its products.

Public Health Bulletins.

During the year the following Public Health Bulletins were prepared and printed:

61. **Studies Upon Leprosy,** XIX–XXIV. By G. W. McCoy, M. J. Clegg, W. J. Goodhue, and H. H. Hollmann.

The results of investigations made at the Leprosy Investigation Station are presented in these six papers.

The subjects discussed relate to glandular tuberculosis among lepers, the danger of associating with lepers, absence of luetin reaction on lepers showing a positive Wassermann reaction, the presence of acid-fast bacilli in secretions and excretions of lepers, fecundity of Hawaiian lepers, and observations on naturally acquired rat leprosy.

62. **Communicable Diseases.** An Analysis of the Laws and Regulations for the Control Thereof in the United States. By J. W. Kerr and A. A. Moll.

This bulletin also includes the decisions rendered by the courts with respect to this subject, and a brief presentation of the sanitation provisions governing food establishments, hotels, railroads, public assemblages, schools, public buildings, jails, public institutions, factories, laundries, barber shops, construction camps, tenement houses, lodging houses, and private dwellings.

63. **Transactions of the Eleventh Annual Conference of State and Territorial Health Officers** with the United States Public Health Service, Minneapolis, Minn., June 16, 1913.

The following subjects were discussed in the conference: Morbidity statistics, cerebrospinal meningitis, sanitation of public conveyances, interstate transportation of tuberculous persons, typhoid fever, quarantine regulations, and cooperation in public health matters.

64. **Quarantine Procedure:** To aid masters of vessels in complying with United States quarantine regulations. By L. E. Cofer.
65. **Typhoid Fever in Rockville, Md.:** Report of an outbreak caused by an infected water supply from a deep well. By L. L. Lumsden.

Public Health Reports.

These reports are issued every Friday in editions aggregating 531,565 copies for the year. The publication consists of three parts, the first relating to the United States, the second to foreign countries, and the third pertaining to sanitary legislation. In the first part also are published regularly special articles on public health subjects, which are frequently reprinted as separates for wider distribution.

Reprints from the Public Health Reports.

135. **The Rat.** A Sanitary Menace and an Economic Burden. By R. H. Creel. July 4, 1913.
136. **Thymol Administration.** Subjective Effects in 464 Administrations in 243 patients. By Ch. Wardell Stiles and Hal F. Boatwright. July 18, 1913.
137. **Pellagra.** Prevalence and Geographic Distribution in Arkansas, Oklahoma, and Texas. By. C. H. Lavinder. July 25, 1913.
138. **A New Design for a Sanitary Pail.** By Victor G. Heiser. July 25, 1913.
139. **Rocky Mountain Spotted (or Tick) Fever.** Sheep Grazing as a Possible Means of Controlling the Wood Tick (Dermacentor Andersoni) in the Bitter Root Valley. By L. D. Fricks. August 8, 1913.
140. **Poliomyelitis (Infantile Paralysis).** A Report of an Outbreak in Texarkana and Vicinity. By Edward Francis. August 15, 1913.

141. **Commission on Milk Standards.** Second Report of the Commission on Milk Standards appointed by the New York Milk Committee. Containing Resolutions adopted at the meeting in Richmond, Va., May 2–3, 1913. August 22, 1913.
142. **Medical Inspection of Schools.** A Lecture Delivered at the Summer School of the South University of Tennessee, Knoxville, Tenn. By J. W. Schereschewsky. August 29, 1913.
143. **Trachoma.** Its Prevalence and Control in the Public Schools of Cebu. By Louis Schwartz. September 12, 1913.
144. **School Hygiene.** Report of the Meeting of the Fourth International Congress on School Hygiene, Buffalo, N. Y., August 25–30, 1913. By J. W. Schereschewsky. October 3, 1913.
145. **Tuberculosis Sanatorium, Fort Stanton, N. Mex.** A Report for the year ended June 30, 1913, of the Sanatorium maintained by the Public Health Service for the Treatment of Tuberculous Patients. By F. C. Smith. October 17, 1913.
146. **Poisons and Habit-Forming Drugs.** A Digest of Laws and Regulations Relating to the Possession, Use, Sale, and Manufacture of Poisons and Habit-Forming Drugs enacted during 1912 and 1913, now in force in the United States. By Martin I. Wilbert and Murray Galt Motter. October 10 and 17, 1913.
147. **The Sanitary Waiting Room.** By W. C. Rucker. October 10, 1913.
148. **Paralysis During Antirabic Treatment.** A Report of Two cases in which paralysis occurred during the course of antirabic treatment. By H. E. Hasseltine. October 24, 1913.
149. **Rat Proofing a Municipal Sewer System.** A Report of an investigation to find a practical method of rat proofing the sewer system of San Francisco. By Friench Simpson. October 31, 1913.
150. **The Citizen and the Public Health.** The Individual's Relation to the Health of the Community. By John W. Trask. November 7, 1913.
151. **The Sale of Bichloride Tablets.** A Discussion of the need for restriction of the sale and distribution of bichloride of mercury tablets. By Martin I. Wilbert. November 14, 1913.
152. **Pellagra.** Brief Comments on our Present Knowledge of the Disease. By C. H. Lavinder. November 21, 1913.
153. **Morbidity Reports.** Their Importance to the Local Health Officer and his work. By John W. Trask. November 28, 1913.
154. **Flies as Carriers of Lamblia Spores.** The Contamination of Food with Human Excreta. By C. W. Stiles and Wm. S. Keister. November 28, 1913.
155. **Heat and Infant Mortality.** By J. W. Schereschewsky. December 5, 1913.
156. **Malaria in North Carolina.** By Henry R. Carter. December 19, 1913.
157. **Typhoid Fever and Gastroenteritis.** A Report of an Outbreak among Passengers of the Steamship "Rochester" September-October, 1913. By Hugh de Valin. December 19, 1913.
158. **Tuberculosis in Switzerland.** Results of the Campaign against the Disease. By W. C. Rucker and R. A. Kearny. December 26, 1913.
159. **Malarial Index Work.** Methods used in Obtaining Blood, making Blood Smears and Staining. By R. H. von Ezdorf. December 26, 1913.
160. **Malarial Fevers.** Prevalence and Geographic Distribution in Arkansas. By R. H. von Ezdorf. January 2, 1914.
161. **The Wilmington (N. C.) Water Supply.** An Investigation made during November and December, 1913. By Earle B. Phelps. January 9, 1914.
162. **Experimental Insect Transmission of Anthrax.** By M. Bruin Mitzmain. January 9, 1914.
163. **Prevalence of Communicable Diseases.** Diphtheria, Measles, Poliomyelitis, Rocky Mountain Spotted (or Tick) Fever, Scarlet Fever, Septic Sore Throat, Tuberculosis, Typhoid Fever, Typhus Fever, and Smallpox. Cases reported, case rates per thousand population, and fatality rates per hundred cases during the year 1912 and the first six months of 1913, in certain States. Compiled by direction of the Surgeon General. January 16, 1914.
164. **Mental Hygiene.** By E. H. Mullan. January 23, 1914.
165. **Smallpox in Germany.** Occurrence during the year 1910 and during the period 1896–1910. Abstracted from Medizinal Statistische Mitteilungen aus dem Kaiserlichen Gesundheitsamte, v. 16, pt. 1. By Emily R. Jones. January 23, 1914.
166. **Public Health Administration in Maryland.** By Carroll Fox. January 30, 1914.

167. **Relative Efficiency of Rat Traps.** Type of Trap which has proved most effective in Manila. By Victor G. Heiser. February 6, 1914.
168. **The Water Supplies of Ships.** A Discussion of the Water Furnished for Drinking Purposes and of the Methods of Sewage Disposal on Ships on Inland Waters. By Hugh de Valin. February 13, 1914.
169. **Rocky Mountain Spotted Fever.** A Report of Its Investigation and of Work in Tick Eradication for Its Control during 1913. By L. D. Fricks. February 20, 1914, and April 24, 1914.
170. **Prevention of Malaria.** Suggestions on How to Screen the Home to keep out Effectively the Mosquitoes which Spread the Disease. By R. H. von Ezdorf. February 27, 1914.
171. **Public Health Administration.** The factors upon which Its Efficiency Depends. By W. C. Rucker. March 6, 1914.
172. **Malarial Fevers.** Prevalence and Geographic Distribution in South Carolina, Georgia, and Florida. By R. H. von Ezdorf. March 13, 1914.
173. **Common Sense in Public Health Administration.** By W. C. Rucker. March 20, 1914.
174. **An Open Letter.** To Owners, Agents, and Masters of Lake and River Vessels. By Rupert Blue. March 20, 1914.
175. **Quinine Prophylaxis for Malaria.** By H. R. Carter. March 27, 1914.
176. **Car Sanitation.** Cleansing and Disinfection of Railroad Coaches. A Report of Methods used at Asheville, N. C. By A. D. Foster. March 27, 1914.
177. **Rural Schools.** Sanitary Survey of Schools in Bartholomew County, Ind. By J. A. Nydegger. February 6, 1914.
178. **The Notifiable Diseases.** Their Prevalence in Cities during 1912. Diphtheria, Malaria, Measles, Epidemic Cerebrospinal Meningitis, Poliomyelitis (Infantile Paralysis), Scarlet Fever, Smallpox, Tuberculosis, Typhoid Fever, Leprosy, and Rabies—Cases Reported, Case Rates per 1,000 population, and Fatality Rates per 100 cases. Compiled by direction of the Surgeon General. April 3, 1914.
179. **The Infectious Diseases.** Recent additions to our Knowledge of their Etiology. By John F. Anderson. April 3, 1914.
180. **Malarial Fevers in the United States.** By R. H. von Ezdorf. April 10, 1914.
181. **The Pollution of Tidal Waters.** Its Bearing on Health and the Importance to the State of Its Control. By Hugh S. Cumming. , April 10, 1914.
182. **Ship Rats and Plague.** April 17, 1914.
183. **Screening as an Antimalarial Measure.** By H. R. Carter. April 17, 1914.
184. **Endemic Goiter.** Its Possible Relationship to Water Supply. By Taliaferro Clark and Claude C. Pierce. April 17, 1914.
185. **Report of Sanitary Survey, St. Joseph, Mo.** By J. H. White. April 24, 1914.
186. **Malarial Fevers.** Prevalence and Geographic Distribution in Alabama. By R. H. von Ezdorf. May 1, 1914.
187. **Typhus Fever.** A Brief Note on Its Prevention. By Joseph Goldberger. May 1, 1914.
188. **Rocky Mountain Spotted Fever.** Some Investigations Made During 1912 by Passed Assistant Surgeon T. B. McClintic. Prepared for publication by L. D. Fricks. April 24, 1914.
189. **Pure Drugs and the Public Health.** By Martin I. Wilbert. May 8, 1914.
190. **State and Insular Health Authorities.** May 8, 1914.
191. **Railroad Water Supplies in Minnesota.** By R. H. Mullin, H. A. Whittaker, and B. M. Mohler. May 15, 1914.
192. **Bacteriological Standards for Milk.** May 15, 1914.
193. **Malarial Fevers.** Prevalence and Geographic Distribution in Mississippi, 1913. By R. H. von Ezdorf. May 22, 1914.
194. **Sanitary Conditions in Alaska.** A Report upon the Diseases Found among the Indians of Southeastern Alaska. By Emil Krulish. May 22, 1914.
195. **Industrial Conditions.** Their Relation to the Public Health. By B. S. Warren. May 29, 1914.
196. **Trachoma in Kentucky.** A Report of a Sanitary Inspection of the Schools of Jefferson County, Ky., with Special Reference to the Prevalence of Trachoma. By J. H. Oakley, Dunlop Moore, and Lawrence Kolb. May 29, 1914.
197. **Industrial Insurance.** Medical Examination of Employees and Prevention of Sickness Its Proper Foundation. By J. W. Schereschewsky. June 5, 1914.
198. **Trachoma.** A Survey of Its Prevalence in the Mountain Sections of Virginia and West Virginia. By Taliaferro Clark. June 5, 1914.
199. **Municipal Ordinances, Rules, and Regulations Pertaining to Public Health During 1912.**

200. **State Laws and Regulations Pertaining to Public Health**, adopted between July 1, 1911, and December 31, 1912.
201. **Public Health Administration in Baltimore.** A Study of the Organization and Administration of the City Health Department. By Carroll Fox. June 12, 1914.
202. **The Reporting of Disease.** The Next Step in Life Conservation. By Louis I. Dublin. June 19, 1914.
203. **The Etiology of Pellagra.** The Significance of Certain Epidemiological Observations with Respect Thereto. By Joseph Goldberger. June 26, 1914.
204. **What is a Safe Drinking Water?** By Allan J. McLaughlin. June 26, 1914.

SUPPLEMENTS TO THE PUBLIC HEALTH REPORTS.

7. **Shower Baths for Country Houses.** A Serviceable and Inexpensive Shower Bath Readily Improvised in Town or Country. By Carroll Fox. August 1, 1913.
8. **Trachoma:** Its Nature and Prevention. By John McMullen. December 12, 1913.
9. **Sanitary Conditions among the Eskimos.** A Report on Conditions in Native Villages along the Arctic Coast of Alaska. By Emil Krulish. December 12, 1913.
10. **The Care of the Baby.** Prepared by a Committee of the American Association for the Study and Prevention of Infant Mortality and Presented to the Association at its Annual Meeting held in Washington, D. C., November 14–17, 1913. December 19, 1913.
11. **What the Farmer Can Do to Prevent Malaria.** By R. H. von Ezdorf. February 13, 1914.
12. **Vital Statistics.** A Discussion of What They Are and Their Uses in Public Health Administration. By John W. Trask. April 3, 1914.
13. **Treatment of Syphilis.** Comparison of the Number of Days' Hospital Treatment Required for Patients Suffering with Syphilis, With and Without the Use of Salvarsan or Neo-Salvarsan. By W. G. Stimpson. April 3, 1914.
14. **Diphtheria: Its Prevention and Control.** By J. W. Schereschewsky. April 17, 1914.
15. **The Administration of a Yellow Fever Campaign.** By Wm. C. Rucker. June 12, 1914.
16. **Summer Care of Infants.** By W. C. Rucker and C. C. Pierce. June 19, 1914.

MISCELLANEOUS PUBLICATIONS.

These Publications comprise all documents not falling properly within any of the foregoing classes. Those of general interest issued during the past year are as follows:

11. **Official List of Officers and Stations of the United States Public Health Service.** July 1, 1914.
12. **List of Publications,** Public Health Service. June, 1914.
13. **The United States Public Health Service as a Career.** By W. C. Rucker, May, 1914.

LIBRARY.

During the year the library was strengthened by the addition of a large number of volumes treating of medical and sanitary matters. Fifty-one medical and scientific journals were subscribed to, and a number of others received either gratuitously or as exchanges. Many of these are bound and become a part of the reference library.

The library is greatly in need of better accommodations. At present it is distributed throughout the bureau wherever space is available, with resulting loss of efficiency and great difficulty in proper handling. An estimate has been made for the reconstruction of the detached building adjoining the Butler Building, with a view to providing space for proper housing of the library.

NEEDS OF THE SERVICE.

The steady growth and increase in activities of the Public Health Service during the past year have emphasized the necessity of a corresponding increase in the number of trained officers for Federal public health work. Congress has recognized this need by increased appropriations for the pay of additional commissioned officers during the fiscal year 1915, although only to the extent of one-half the estimate submitted by the department. Toward the close of the past fiscal year the appearance of bubonic plague in New Orleans created an emergency which called for the detail of experienced men, and to meet the situation it became necessary to take officers from other important work and concentrate them in that city for an intensive campaign of plague eradication. The resulting curtailment of important operations in other sections has been seriously felt.

Another urgent need of the service is that of additional clerical assistance in the bureau at Washington. The increases in the clerical force of the bureau have not been commensurate with the increase in supervisory and administrative work incident to extended operations in the field, and the work of the bureau at times becomes seriously handicapped because of the lack of clerical help. In several instances it has been necessary to disapprove requests for leaves of absence in cases where such leave had been earned by conscientious service.

An additional building for the use of the Hygienic Laboratory should be provided. The work of the laboratory has greatly increased in the past few years. Its operations are intimately connected with field investigations of diseases of man, pollution of streams, sewage disposal, and the sanitation of interstate carriers, and increased accommodations for the force of workers employed are badly needed.

It is important to the conduct of public health work that a thorough knowledge of the occurrence, prevalence, and distribution of disease be obtained. An appropriation for the employment of persons in the collection of morbidity statistics has been requested, and it is hoped that this appropriation will be allowed.

During the fiscal year 1914 the demand for service publications far exceeded that of any previous year in the history of the service. Although nearly three times as many publications were distributed as during the preceding fiscal year, because of the limited appropriation for this purpose the bureau was not able to comply with all requests. The large number of requests for literature on health subjects received from persons in all sections of the country is a certain indication of increasing interest in the public health, and it is believed that the Federal Government should stimulate and encourage this interest, and endeavor in all possible ways to assist in the education of the individual by supplying educational literature.

Respectfully submitted.

Rupert Blue,
Surgeon General.

APPENDIX.

FINANCIAL STATEMENT.

RECEIPTS AND EXPENDITURES, PUBLIC HEALTH SERVICE, FOR THE FISCAL YEAR ENDED JUNE 30, 1914.

Appropriation: "Public Health Service, 1914."

Subheads of appropriations.	Appropriations and repayments.	Expenditures.	Balance June 30, 1914.
Pay, etc., commissioned officers and pharmacists	$597,640.00	$572,496.12	$25,143.88
Pay of acting assistant surgeons	200,000.00	190,605.04	9,394.96
Pay of other employees	477,606.00	474,034.12	3,571.88
Freight, transportation, etc	30,000.00	29,886.21	113.79
Fuel, light, and water	74,000.00	73,151.35	848.65
Furniture, etc	8,000.00	7,995.56	4.44
Purveying depot supplies (appropriation $45,000)	49,733.35	49,012.17	721.18
Maintenance:			
Hygienic laboratory	20,000.00	19,812.78	187.22
Marine hospitals (appropriation $256,000)	265,989.12	260,987.01	5,002.11
Care of seamen, etc. (appropriation $126,000)	127,849.65	122,550.25	5,299.40
Books	500.00	495.57	4.43
Disbursements		[1] 1,769,724.23	
Encumbrances		31,301.95	
Total (appropriation $1,834,746)	1,851,318.12	1,801,026.18	50,291.94

[1] Includes $1,800 transferred to "Contingent expenses, Treasury Department, stationery, 1914."

NOTE.—For expenditures by stations under marine hospitals and relief, see Statistical Table No. II.

Appropriation: "Preventing the spread of epidemic diseases, 1914–15."

Amount of appropriations		$300,000.00
Repayments		88.00
Total		300,088.00
Expenditures:		
Disbursements	[1] $199,298.59	
Encumbrances	289.89	
As follows:		
Plague suppressive measures—		
California	133,891.29	
Porto Rico	6,321.23	
Seattle, Wash	7,835.94	
Trachoma—		
Kentucky	14,096.81	
Smallpox—		
Eagle Pass, Tex., and miscellaneous	2,889.06	
Preventive measures—		
New Orleans	2,025.23	
Philadelphia	12,049.53	
Cuba	6,290.88	
China, Japan, Italy	3,042.58	
Travel	7,705.80	
Vaccine, telegrams, etc	3,440.13	
		199,588.48
Balance June 30, 1914:		
Appropriation fiscal year 1914	499.52	
Available during fiscal year 1915	100,000.00	
		100,499.52

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[1] Includes $200 transferred to "Contingent expenses, Treasury Department, stationery 1914."

NOTE.—Payments amounting to $88,744.62 were made from pay items of appropriation "Public Health Service, 1914," account of epidemic duty.

Appropriation: "Quarantine service, 1914."

Amount of appropriation		$155,000.00
Repayments		1,421.97
Total		156,421.97
Expenditures:		
Disbursements [1]	$143,380.83	
Encumbrances	5,673.79	
		149,054.62
Balance, June 30, 1914		7,367.35

Expenditures by stations.

Name of station.	Pay and allowances, officers and employees.[2]	Maintenance.	Total maintenance, pay and allowances.
Alexandria, Va	$20.00		$20.00
Beaufort, S. C	1,517.50	$385.68	1,903.18
Biscayne Bay	1,590.00	76.16	1,666.16
Boca Grande	2,220.00	523.70	2,743.70
Brunswick	2,919.00	3,001.23	5,920.23
Cape Charles	6,779.00	6,264.11	13,043.11
Cape Fear, N. C	4,909.33	2,769.00	7,678.33
Cedar Keys	300.00		300.00
Charleston, S. C	7,297.17	2,124.99	9,422.16
Columbia River, Oreg	10,816.34	3,730.26	14,546.60
Coos Bay, Oreg		5.80	5.80
Cumberland Sound	3,180.00	72.00	3,252.00
Delaware Breakwater	3,993.33	2,741.09	6,734.42
Eagle Pass, Tex	1,945.00	27.50	1,972.50
Eastport, Me	1,200.00		1,200.00
Eureka	540.00	425.15	965.15
Fort Bragg	40.00		40.00
Galveston, Tex	1,128.00	1,000.89	2,128.89
Georgetown, S. C	240.00	28.25	268.25
Gulf	9,295.22	3,700.31	12,995.53
Gulfport	600.00		600.00
Hawaii	29,553.17	12,246.85	41,800.02
Key West	4,420.55	2,099.36	6,519.91
Laredo, Tex	1,700.50	225.88	1,926.38
Miscellaneous		5,363.49	5,363.49
Mobile	11,481.56	5,678.60	17,160.16
Monterey, Cal	10.00		10.00
Newbern, N. C	200.00		200.00
New Orleans, La	26,543.78	10,126.59	36,670.37
Pascagoula	1,182.50	235.63	1,418.13
Pensacola, Fla	7,522.66	4,291.82	11,814.48
Perth Amboy, N. J	1,729.16	1,476.19	3,205.35
Port Harford, Cal	1,030.00		1,030.00
Port Inglis	510.00	273.32	783.32
Portland, Me	8,188.00	1,367.01	9,555.01
Porto Rico	27,971.66	10,993.69	38,965.35
Port Royal, S. C	1,500.00	323.44	1,823.44
Port Townsend	14,466.83	4,049.12	18,515.95
Providence, R. I	4,337.32	218.61	4,555.93
Punta Rassa	150.00		150.00
Reedy Island	6,643.50	16,519.00	23,162.50
St. Andrews, Fla	330.00	126.00	456.00
St. Georges Sound	2,920.00	424.00	3,344.00
St. Johns River	2,000.00	421.00	2,421.00
St. Joseph	280.00	51.00	331.00
San Diego, Cal	6,244.00	3,558.15	9,802.15
San Francisco, Cal	29,176.48	20,149.52	49,326.00
San Pedro, Cal	300.20	395.45	695.65
Santa Barbara, Cal	55.00		55.00
Savannah	7,650.34	5,236.38	12,886.72
Tampa Bay	7,725.15	6,803.29	14,528.44
Washington, N. C	681.66		681.66
Leprosy Hospital	18,710.84	9,525.11	28,235.95
Total	285,744.75	149,054.62	434,799.37

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[1] Includes $500 transferred to "Contingent expenses, Treasury Department, stationery, 1914."
[2] Paid from pay items appropriation "Public Health Service, 1914."

Appropriation: "Field investigations of public health, 1914."

Amount of appropriation		$200,000.00
Expenditures:		
Disbursements	$156,733.15	
Encumbrances	5,282.07	
As follows:		
Pollution of the Ohio River	40,408.74	
Malaria	7,164.22	
Pellagra	27,005.79	
Pollution of coastal waters	38,003.42	
School hygiene	4,812.09	
Industrial hygiene	2,597.01	
Tuberculosis in Cincinnati industries	1,076.37	
Typhoid fever	2,784.06	
Miscellaneous sanitation, travel, etc	38,163.52	
		162,015.22
Balance June 30, 1914		37,984.78

NOTE.—Payments amounting to $14,236.69 were made from appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1914," on account of field investigations.

Appropriation: "National quarantine and sanitation."

Balance, July 1, 1913		$22,798.01
Expenditures	$625.32	
Transferred to Supervising Architect	3,453.50	
		4,078.82
Balance, June 30, 1914		18,719.19

Appropriation: "Interstate quarantine service, 1914."

Amount of appropriation		$15,000.00
Expenditures:		
Disbursements	$7,954.86	
Encumbrances	3,286.41	
		11,241.27
Balance June 30, 1914		3,758.73

Appropriation: "Special studies of pellagra, Public Health Service, 1914–15."

Amount of appropriarion	$47,000.00
Balance June 30, 1914	47,000.00

Appropriation: "Relief and transportation of American citizens in Mexico, Public Health Service."

Amount of appropriation	$4,000.00
Expenditures	2,530.65
Balance June 30, 1914	1,469.35

Appropriation: "Providence, R. I., Quarantine Station, 1914–15."

Amount of appropriation	$25,000.00
Balance June 30, 1914	25,000.00

Appropriation: "Salaries, Office of Surgeon General, Public Health Service, 1914."

Amount of appropriation	$49,780.00
Expenditures	48,758.83
Balance June 30, 1914	1,021.17

Construction appropriations.

LEPROSY HOSPITAL, HAWAII.

Balance June 30, 1914 (act Mar. 3, 1905)	$16, 956. 35

HYGIENIC LABORATORY.

Balance (act June 25, 1910)	$15, 000. 00
Transferred to Supervising Architect	15, 000. 00
Amount appropriated (act June 23, 1913)	25, 000. 00
Transferred to Supervising Architect	25, 000. 00

MARINE HOSPITALS.

Cleveland, Ohio:	
Balance June 30, 1914 (act Mar. 4, 1909)	$100. 00
Balance June 30, 1914 (act Mar. 4, 1907)	374. 95
Fort Stanton, N. Mex.:	
Balance June 30, 1914 (act Aug. 24, 1912)	3. 20
Under Supervising Architect:	
Baltimore, Md. (act June 23, 1913)	2, 500. 00
Chicago, Ill. (act June 25, 1910)	6, 000. 00
Detroit, Mich. (act June 23, 1913)	1, 000. 00
Wilmington, N. C. (act June 23, 1913)	5, 000. 00

QUARANTINE STATIONS.

[Balances, June 30, 1914.]

Brunswick, Ga. (act June 25, 1910)	$1, 708. 87
Charleston, S. C. (act Mar. 4, 1909)	634. 46
Columbia River (act June 25, 1910)	745. 47
Delaware Breakwater (act Mar. 4, 1907)	857. 00
Gulf (act Mar. 4, 1907)	353. 35
Honolulu (act Mar. 4, 1907)	390. 52
Pensacola (act Mar. 4, 1907)	18. 02
Reedy Island (act Mar. 4, 1909)	66. 71
San Francisco (act June 30, 1906)	3, 201. 35
San Francisco (act May 27, 1908)	180. 75
Savannah (act Mar. 4, 1909)	410. 85
Under Supervising Architect:	
Cape Charles (act June 23, 1913)	8, 000. 00
Honolulu (act Aug. 24, 1912)	35, 000. 00
Reedy Island (act June 23, 1913)	33, 500. 00
San Diego (act June 23, 1913)	1, 500. 00
San Francisco (act June 23, 1913)	20, 000. 00

STATISTICAL TABLES.

TABLE I.—*Comparative table of number of patients annually treated, 1868 to 1914.*

Fiscal year.	Sick and disabled seamen furnished relief.	Fiscal year.	Sick and disabled seamen furnished relief.
Prior to organization:		After reorganization—Continued.	
1868	11,535	1891	52,992
1869	11,356	1892	53,610
1870	10,560	1893	53,317
After reorganization:		1894	52,803
1871	14,256	1895	52,643
1872	13,156	1896	53,804
1873	13,529	1897	54,477
1874	14,356	1898	52,709
1875	15,009	1899	55,489
1876	16,808	1900	56,355
1877	15,175	1901	58,381
1878	18,223	1902	56,310
1879	20,922	1903	58,573
1880	24,860	1904	58,556
1881	32,613	1905	57,013
1882	36,184	1906	54,363
1883	40,195	1907	55,129
1884	44,761	1908	54,301
1885	41,714	1909	53,704
1886	43,822	1910	51,443
1887	45,314	1911	52,209
1888	48,203	1912	51,078
1889	49,518	1913	50,604
1890	50,671	1914	53,226

TABLE II.—*Exhibit of the operations of the service for the fiscal year ended June 30, 1914.*

	Total number of seamen treated.	Patients in hospital July 1, 1913.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1914.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days hospital relief furnished foreign seamen.	Amount expended.
Total (first, second, third, and fourth class stations)	53,226	921	13,548	14,469	12,940	456	1,073	411,122	38,757	63,866	7,983	466	6,664	$872,327.00
First-class stations.														
Baltimore, Md	2,303	53	638	691	613	25	53	24,363	1,612	2,293	408			45,339.09
Boston, Mass	2,663	63	609	672	589	30	53	20,189	1,991	3,563	416	40	558	46,516.91
Buffalo, N. Y	1,958	11	337	348	325	9	14	7,894	1,610	2,534	122			21,532.04
Cairo, Ill	661	9	129	138	128	6	4	2,324	523	627	1			14,049.64
Chicago, Ill	2,109	43	727	770	705	23	42	24,011	1,339	2,436	144			48,707.62
Cleveland, Ohio	2,008	26	407	433	389	10	34	10,343	1,575	2,941	88	1	9	22,657.86
Detroit, Mich	1,684	16	438	454	414	8	32	10,827	1,230	2,610	98			25,063.97
Evansville, Ind	628	5	160	165	149	5	11	4,784	463	649	28			14,824.70
Fort Stanton, N. Mex	328	146	182	328	86	56	186	67,760						115,677.87
Key West, Fla	391	3	102	105	97	3	5	2,389	286	407	84	10	129	11,949.14
Louisville, Ky	718	10	222	232	207	5	20	5,766	486	952	40			15,628.44
Memphis, Tenn	1,340	5	299	304	282	11	11	4,850	1,036	1,561	80			15,211.90
Mobile, Ala	794	20	338	358	314	12	32	8,399	436	835	89	148	2,188	18,749.93
New Orleans, La	1,718	32	424	456	394	20	42	14,820	1,262	2,366	197	102	1,200	32,019.00
New York, N. Y	4,215	80	1,432	1,512	1,382	32	98	30,044	2,703	4,353	1,396	6	147	52,500.87
Pittsburgh, Pa	593	6	137	143	137	4	2	2,562	450	759	51			13 810.35
Portland, Me	653	13	230	243	219	10	14	7,657	410	537	145	14	175	22,280.36
Port Townsend, Wash	386	40	261	301	248	9	44	16,586	85	168	19	14	254	15,854.35
San Francisco, Cal	3,073	84	1,192	1,276	1,166	41	69	32,046	1,797	4,130	557	33	530	53,078.49
St. Louis, Mo	935	16	238	254	220	10	24	8,417	681	1,022	116			19,223.59
Savannah, Ga	1,263	27	350	377	332	11	34	10,214	886	1,220	74	11	216	23,575.65
Vineyard Haven, Mass	287	11	95	106	90	5	11	4,201	181	315	5	1	2	14,109.62
Wilmington, N. C	512	4	145	149	143		6	2,333	363	473	62	9	201	8,696.94
Total	31,220	723	9,092	9,815	8,629	345	841	322,779	21,405	36,751	4,220	389	5,609	671,058.33
Second, third, and fourth class stations.														
Albany, N. Y	93	2	31	33	27	1	5	765	60	138	14			1,310.47
Ancon, Canal Zone	65	6	59	65	61	1	3	720						4,681.70
Apalachicola, Fla	61	1	29	30	29		1	345	31	87				858.85
Ashland, Wis	92		14	14	13		1	417	78	99				636.25

Ashtabula, Ohio	243	1	31	32	31	1		780	311	322	11			1,622.90
Astoria, Oreg	160		37	37	37			433	123	207	68			1,178.00
Bangor, Me	51		8	8	7		1	128	43	55	24			663.40
Barnstable, Mass., and subports	1								1	4				4.00
Bay City, Mich	88		12	12	12			176	76	168	7			376.02
Beaufort, N. C	69		3	3	3			62	63	78	54			507.25
Beaufort, S. C	39								39	39				39.00
Bellingham, Wash	54		28	28	28			271	26	27				672.60
Boothbay Harbor, Me	78		9	9	8		1	130	69	172	9			513.00
Bridgeport, Conn	16	2	10	12	10	1	1	183	4	5	2			117.32
Brunswick, Ga	88		15	15	15			220	73	97				858.50
Burlington, Iowa	8		4	4	2		2	26	4	12				42.50
Cambridge, Md	46		32	32	31	1		456	14	16				720.58
Castine, Me	1								1	1				1.00
Cedar Keys, Fla	6		1	1	1			14	5	5				26.00
Charleston, S. C	525		59	59	59			725	466	623	43			2,310.35
Chattanooga, Tenn	3		3	3	3			57						111.70
Cincinnati, Ohio	185	2	13	15	15			204	170	275	23			1,402.61
Crisfield, Md	103								103	160	3			301.87
Delaware Breakwater, Del	153	1	8	9	7	1	1	141	144	196	49			
Duluth, Minn	467	3	56	59	52	4	3	939	408	451	46			1,603.08
Eastport, Me	69								69	132				63.90
Edenton, N. C	49								49	73				83.74
Elizabeth City, N. C	115								115	199	189			385.83
Ellsworth, Me	5								5	7				7.00
Erie, Pa	131	1	24	25	23		2	416	106	162	19			1,051.50
Escanaba, Mich	37	1	7	8	8			103	29	32				397.00
Eureka, Cal	58	1	13	14	14			157	44	51	12			675.32
Fernandina, Fla	95		6	6	6			92	89	162				460.40
Gallipolis, Ohio	160		57	57	54	1	2	1,124	103	231	7			1,791.00
Galveston, Tex	1,659	14	507	521	499	7	17	6,439	1,138	1,524	188			12,234.18
Georgetown, S. C	228		19	19	19			149	209	279	15			853.50
Gloucester, Mass	240	2	13	15	12	1	2	562	225	315	40			1,347.26
Government Hospital for the Insane	53	45	8	53	2	4	47	17,467						11,269.42
Grand Haven, Mich	59		18	18	14		4	132	41	64	79			513.52
Green Bay, Wis	51		8	8	8			110	43	48	6			467.60
Gulfport, Miss	27		4	4	4			43	23	44	52			92.15
Hartford, Conn	14	1	13	14	12	2		289			4			288.00
Honolulu, Hawaii	635	17	196	213	197	3	13	5,668	422	588	46	13	147	12,766.94
Hoquiam, Wash	43	1	26	27	26	1		324	16	16	7			1,023.45
Irvington, Va	30		5	5	5			144	25	29				632.00
Jacksonville, Fla	370	1	41	42	39	1	1	453	328	404	37			1,682.36
Juneau, Alaska	99		24	24	22		2	448	75	177				1,903.50
Kansas City, Mo	17								17	19	1			333.35
Ketchikan, Alaska	150		23	23	20	2	1	223	127	208	3			1,537.35
La Crosse, Wis	43	1	11	12	11		1	165	31	40	9			526.00
Little Rock, Ark	23		4	4	3	1		29	19	26	2			268.33
Los Angeles, Cal	527	9	142	151	140	2	9	2,129	376	543	37			11,048.40
Ludington, Mich	93	1	12	13	13			226	80	134	56			646.67
Machias, Me	17		7	7	6		1	307	10	15	68			779.35
Manistee, Mich	78		10	10	7	2	1	262	68	117	36			733.80

TABLE II.—*Exhibit of the operations of the service for the fiscal year ended June 30, 1914.*—Continued.

	Total number of seamen treated.	Patients in hospital July 1, 1913.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1914.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days hospital relief furnished foreign seamen.	Amount expended.
Second, third, and fourth class stations—Continued.														
Manitowoc, Wis.	147	4	58	62	60	......	2	695	85	133	10	......	......	$1,105.22
Marquette, Mich.	76	......	10	10	9	......	1	165	66	67	16	......	......	525.00
Menominee, Mich.	23	......	2	2	2	......	......	71	21	31	2	......	......	370.25
Milwaukee, Wis.	1,041	11	180	191	183	5	3	3,831	850	1,145	149	......	......	9,875.76
Nashville, Tenn.	49	......	6	6	6	......	......	55	43	91	17	......	......	403.80
Natchez, Miss.	125	......	5	5	4	......	1	30	120	299	5	......	......	436.75
New Bedford, Mass.	83	......	12	12	10	2	......	426	71	128	53	......	......	903.15
Newbern, N. C.	231	1	18	19	18	......	1	179	212	341	31	......	......	980.47
New Haven, Conn.	37	......	20	20	17	1	2	342	17	24	43	......	......	649.75
New London, Conn.	74	......	13	13	13	......	......	187	61	63	41	......	......	1,348.88
Newport, Ark.	64	......	1	1	......	......	1	53	63	92	......	......	......	444.50
Newport, R. I.	47	......	39	39	34	......	5	536	8	13	41	......	......	1,104.00
Newport News, Va.	31	......	......	......	......	......	......	......	31	31	......	......	......	322.35
Nome, Alaska.	11	......	2	2	1	......	1	70	9	33	......	......	......	1,692.00
Norfolk, Va.	3,611	14	640	654	618	21	15	8,395	2,957	3,578	299	......	......	15,332.69
North Bend, Oreg.	33	1	9	10	10	......	......	146	23	23	14	......	......	596.25
Ogdensburg, N. Y.	96	......	8	8	6	......	2	147	88	196	22	......	......	562.20
Oswego, N. Y.	30	......	9	9	9	......	......	72	21	31	......	......	......	179.20
Paducah, Ky.	68	......	7	7	7	......	......	60	61	135	5	......	......	438.37
Pensacola, Fla.	284	2	45	47	45	2	......	621	237	668	47	......	......	1,475.65
Perth Amboy, N. J.	20	......	1	1	1	......	......	5	19	19	......	......	......	78.00
Philadelphia, Pa.	1,640	15	433	448	422	8	18	6,209	1,192	1,845	565	......	......	22,534.28
Ponce, P. R.	37	......	9	9	9	......	......	136	28	67	......	......	......	170.00
Port Arthur, Tex.	134	......	5	5	5	......	......	49	129	285	9	......	......	296.50
Port Huron, Mich.	84	2	......	2	2	......	......	66	82	239	91	......	......	484.00
Portland, Oreg.	773	10	169	179	157	7	15	3,997	594	1,087	67	24	281	10,117.57
Portsmouth, N. H.	16	......	1	1	1	......	......	15	15	15	23	......	......	39.00
Port Tampa, Fla.	162	1	59	60	51	4	5	1,386	102	115	8	......	......	2,430.86
Providence, R. I.	278	5	118	123	113	3	7	1,995	155	196	57	......	......	2,985.50
Provincetown, Mass.	50	......	......	......	......	......	......	......	50	56	52	......	......	230.50
Richmond, Va.	42	......	7	7	6	1	......	107	35	81	......	......	......	587.70
Rockland, Me.	258	......	1	1	1	......	......	13	257	515	38	......	......	514.45
St. Paul, Minn.	10	......	3	3	3	......	......	66	7	10	......	......	......	257.96
Saginaw, Mich.	67	1	5	6	6	......	......	84	61	66	1	......	......	386.43
Salem, Mass.	3	......	......	......	......	......	......	......	3	3	......	......	......	4.00
San Diego, Cal.	97	......	27	27	27	......	......	428	70	117	14	14	218	5,294.22

Sandusky, Ohio	60	1	8	9	9			277	51	91	16			477.00
San Juan, P. R.	435	2	121	123	117	1	5	2,375	312	483	57	1	8	3,477.50
Sault Ste. Marie, Mich	177	6	97	103	99	1	3	1,473	74	82	45			2,361.13
Seattle, Wash	1,767	3	269	272	256	6	10	3,325	1,497	2,822	452	16	258	10,163.34
Sheboygan, Wis	12		3	3	3			53	9	9	13			357.25
Solomons, Md	273		10	10	10			74	263	451				597.39
Superior, Wis	279	4	82	86	82		4	1,368	193	197				2,542.75
Tacoma, Wash	136		27	27	26	1		423	109	196	6	10	151	1,507.65
Toledo, Ohio	446	1	122	123	113	7	3	2,070	323	1,083	23			2,905.10
Unalaska, Alaska	13		8	8	6		2	64	5	5				91.00
Valdez, Alaska	276		15	15	14		1	179	261	275				1,559.70
Vicksburg, Miss	193	1	68	69	66	2	1	679	124	220				1,685.33
Washington, D. C	122		23	23	20	1	2	387	99	156	18			1,865.90
Washington, N. C	105		9	9	8	1		116	96	131	15			138.65
Quarantine stations	12		12	12	12			190						
For special examination of members Life-Saving Service.														
Alpena, Mich											38			
Cape Charles, Va											15			
Ellisburg, N. Y											16			
Orleans, Mass											48			
Patchogue, N. Y											8			
Plymouth, Mass											10			
Rogers City, Mich											10			
Total	22,006	198	4,456	4,654	4,311	111	232	88,343	17,352	27,115	3,763	77	1,055	201,308.67

Total expenditures for first-class stations	$671,058.33
Total expenditures for second, third, and fourth class stations	201,308.67
Washington, D. C. (bureau)	47,271.61
Washington, D. C. (Hygienic Laboratory)	152,754.90
Washington, D. C. (purveying depot)	55,240.28
Special duty	23,292.32
Immigration	231,403.39
Railroad transportation, freight charges, etc	23,497.64
Miscellaneous	6,442.98
Total expenditures	1,412,270.12

TABLE III.—*Summary of physical examinations made by officers of the United States Public Health Service during the fiscal year ended June 30, 1914, exclusive of immigrants.*

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Revenue-Cutter Service.	Life-Saving Service.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Isthmian Canal Commission.	Philippine Islands.
Total number examined	7,983	3,549	941	1,372	1,514	108	51	6	241	180	5	16
Number passed	7,545	3,457	912	1,157	1,448	103	49	5	223	170	5	16
Number rejected	438	92	29	215	66	5	2	1	18	10		
Causes of rejection, diseases, disability, etc.												
Alien, deportation	2								2			
Acne	1									1		
Albuminuria	4			3		1						
Alcoholism	2			1					1			
Anemia	1		1									
Asthma	2			1					1			
Cicatrix of penis	1			1								
Choroiditis	1	1										
Curvature of the spine	3			1	1				1			
Defectivehearing	2				1					1		
Defective color sense	88	52	10	19	5	1				1		
Defective teeth	2			2								
Defective vision	84	36	5	36	7							
Deformation of foot	1			1								
Degeneration posterior column of spine	1								1			
Diastolic murmur	1			1								
Eczema	1			1								
Enlarged cervical glands	1			1								
Enlarged tonsils	6			6								
Enlarged glands of jaw	1			1								
Epispadias	1				1							
Epilepsy	1				1							
Fistula in ano	2				1					1		
Flat foot	8		1	7								
General malnutrition	2			2								
Goiter	1			1								
Gonorrhea	10		1	9								
Gonorrhea, phimosis	1			1								
Hernia:												
Inguinal	10		2	3	4				1			
Abdominal	1			1								
Unclassified	6			3				1	1	1		
Heart lesion	1			1								
Hydrocele tunica vaginalis	1			1								
Hypertrophy of heart	2			2								
Hypertrophy of prostate	1		1									
Hypersusceptibility to heat	1		1									
Inflammation of stomach, chronic	1			1								
Irregular heart action	5			1	3					1		
Loss of eye	1						1					
Loss of uvula	1			1								
Loss of vision in one eye	3			1	2							
Loss of upper teeth	1			1								
Loss of lower teeth	1			1								
Mitral insufficiency	3			2	1							
Mitral and aortic regurgitation	1				1							
Mitral regurgitation	13			2	11							
Myalgia, lumbago	2		1		1							
Myopia	1				1							
Necrosis of bone of leg	1								1			
Nephritis, chronic	1				1							
Old fracture of olecranon	8				8							
Organic heart disease	1			1								
Perforation nasal septum	1			1								
Pharyngitis, acute	1				1							
Physical disability	1				1							
Phthisis pulmonaris	2								2			
Phimosis	1			1								
Physically unsound	20	1	3	13	1					2		
Piles:												
External	3			1	1		1					
Mixed	1				1							
Unclassified	2			2								
Poor physique	5			5								
Pyorrhea	1			1								
Rachitis of spine	2			2								
Rales over apex of lung	1			1								
Rapid heart action	4			4								

TABLE III.—*Summary of physical examinations made by officers of the United States Public Health Service during the fiscal year ended June 30, 1914, exclusive of immigrants*—Continued.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Revenue-Cutter Service.	Life-Saving Service.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Isthmian Canal Commission.	Philippine Islands.
Causes of rejection, diseases, disability, etc.—Continued.												
Removed testicle and defective vision	1								1			
Refused vaccination	1			1								
Rheumatism	2		2									
Scabies	2			2								
Sprain of back	4				4							
Syphilis	8			6					2			
Systolic murmur	1									1		
Stiff finger joints	2		1	1								
Tonsillitis	1			1								
Trachoma	2								2			
Tuberculosis	8			5	2	1						
Ulcer of penis	1								1			
Under height	8			7	1							
Under weight	5			3	2							
Valvular disease of heart	2			2								
Venerial warts	4			4								
Varix	5			4	1							
Varicocele	18			17		1						
Venereal disease	1			1								
Weak eyes	1			1								
Weak and enlarged inguinal ring	1			1								
Weak lungs	1			1								

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914.*

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Total cases	**921**	**13,548**	**6,919**	**5,461**	**555**	**456**	**1,073**	**38,757**	**53,182**
General diseases	**430**	**5,133**	**2,095**	**2,432**	**278**	**219**	**523**	**13,666**	**19,196**
Smallpox	2	44	43		3			18	64
Cowpox		2	1		1			808	810
Chicken pox		4	4					3	7
Measles		53	48	1	1	1	2	4	57
Rubella		2	2						2
Scarlet fever		2	2					1	3
Typhus fever		1				1			1
Dengue		6	3	3				2	8
Influenza	2	201	175	26	1	1		717	920
Whooping cough								3	3
Mumps	2	32	29	5				41	75
Diphtheria	1	6	7					1	8
Cerebrospinal fever		1				1			1
Simple continued fever	1	18	13	5			1	9	28
Enteric fever	30	323	260	28		37	28	19	372
Choleraic diarrhea		9	7	2				36	45
Dysentery	2	59	31	26	2		2	70	131
Beriberi		7	6			1			7
Malarial fever:									
Intermittent	8	420	286	120	7	3	12	1,134	1,552
Remittent	1	133	92	33	3	4	2	78	212
Phagedona, sloughing	1			1					1
Erysipelas	4	28	29	2		1		17	49
Pyemia		1	1					1	2
Septicemia		4	2	2				24	28
Tetanus								1	1
Tubercle	236	795	44	497	106	127	267	200	1,274
Leprosy	2	2			1		3		4

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
General diseases—Continued.									
Syphilis:									
Primary	4	71	7	57	9		2	238	313
Secondary	8	1,209	130	941	60	6	80	2,559	3,761
Tertiary	2	31	1	30			2	45	78
Gonorrhea	31	312	130	172	11	1	29	4,112	4,447
Hydrophobia									2
Diseases dependent on animal parasites:									
Tenia solium		13	10	1	1		1	17	30
Tenia mediocanellata		3	2				1	6	9
Ascaris lumbricoides		3		3				1	4
Ameba		14	2		12				14
Pediculis capitis		12	12					11	23
Pediculis vestimenti		2	1	1					2
Phthirius inguinalis								7	7
Tenia versicolar		1	1					5	6
Sarcoptes scabiei		27	21	5			1	213	240
Entomeba hystolytica		2	2						2
Diseases dependent on vegetable parasites:									
Achorion Schönleinii		1		1					1
Trichophyton tonsurans								19	19
Streptococcus pyogenus		3		3					3
Nectar Americanus	1	34	11	22	1		1		35
Tenia tonsurans								34	34
Tenia circinata								33	33
Tenia sycosis								11	11
Tenia saginata	1	1		2					2
Effects of animal poisons:									
Decayed and poisonous food		9	8	1				15	24
Effects of vegetable poisons:									
Tobacco								11	11
Poison ivy		11	8	3				7	18
Cocaine		1	1					1	2
Effects of inorganic poisons:									
Lead		7	1	5		1		7	14
Mercury		1		1				1	2
Coal gas		2	2						2
Lye		1	1						1
Effects of the presence of foreign bodies	2	2	1	3				54	58
Effects of mechanical injuries								12	12
Effects of heat		10	6	4				5	15
Effects of cold		2	2					4	6
Effects of chemical agents		3	1	2				8	11
Effects of excessive exertions and strain		1	1						1
Pellagra	3	40		25	6	2	10	8	51
Alcoholism	6	219	136	71	8	5	5	180	405
Rheumatic fever	4	128	86	35	2	1	8	89	221
Rheumatism	24	558	306	218	10	6	42	2,149	2,731
Gout		2		2				3	5
Osteoarthritis	2	4		1	1		4	6	12
Cyst:									
Mucous		1	1					3	4
Sebaceous	1	14	12	2			1	74	89
New growth, nonmalignant:									
Lipoma		8	3	3	1		1	15	23
Fibroma		15	6	7			2	25	40
Chondroma		1	1					4	5
Condyloma		3	2	1				15	18
Endothelioma		1	1						1
Lymphangioma		1			1				1
Papilloma		18	11	6			1	122	140
Adenoma								1	1
Pterygium		2	2					12	14
New growth, malignant:									
Sarcoma	2	6	4	1		2	1	3	11
Carcinoma	2	30	12	5	3	10	2	9	41
Squamous carcinoma	4	36	8	10	18	3	1	25	65

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
General diseases—Continued.									
Leucocythemia	1	1	......	1	......	......	1	......	2
Anemia	8	18	13	10	2	1	......	34	60
Idiopathic anemia	......	4	......	1	......	1	2	1	5
Purpura	......	2	1	1	......	......	......	1	3
Hodgkin's disease	......	1	......	1	......	......	......	......	1
Diabetes mellitus	2	16	5	7	......	4	2	19	37
Diabetes insipidus	......	......	......	......	......	......	......	8	8
Hemophelia	......	1	......	1	......	......	......	1	2
Congenital malformations	......	10	5	2	2	......	1	2	12
Undescended testicle	......	......	......	......	......	......	......	1	1
Debility	2	31	14	13	1	1	4	230	263
Old age	1	2	......	......	2	......	1	3	6
LOCAL DISEASES.									
DISEASES OF THE NERVOUS SYSTEM	137	358	83	192	42	29	149	866	1,361
Of the nerves—									
Inflammation—									
Neuritis	8	47	18	30	3	......	4	100	155
Multiple neuritis	1	6	2	5	......	......	......	4	11
Of the spinal cord and membranes—Cord—									
Inflammation—									
Diffuse	......	1	......	......	......	1	......	......	1
Local	......	......	......	......	......	......	......	1	1
Degeneration—									
Of anterior cornua	......	2	......	......	1	......	1	1	3
Of lateral columns	1	2	......	1	......	1	1	......	3
Of posterior columns	24	33	1	18	6	2	30	12	69
Of lateral and posterior columns	......	2	......	1	......	......	1	......	2
Of the brain and its membranes—Membranes—									
Inflammation of dura mater	......	..	1	......	......	1	......	......	1
Hemorrhage	......	......	......	......	......	......	......	1	1
Of the brain and its membranes—Brain—									
Abscess	......	1	......	......	......	1	......	......	1
Softening	......	1	......	1	......	......	......	......	1
Hemorrhage	6	10	......	7	1	6	2	2	18
Hyperemia	......	......	......	......	......	......	......	3	3
Functional nervous disorders with other disease of undetermined nature—									
Apoplexy	1	10	1	3	1	4	2	......	11
Paralysis—									
Paraplegia	2	6	......	2	1	......	5	3	11
Hemiplegia	23	41	5	22	3	5	29	11	75
Monoplegia	......	2	......	2	......	......	......	......	2
Local paralysis	1	12	8	3	2	......	......	14	27
Catalepsy	......	......	......	......	......	......	......	1	1
Incomplete paralysis	4	2	1	3	......	......	2	4	10
Paralysis agitans	......	3	......	1	1	......	1	3	6
Spasm	......	8	7	......	......	......	1	17	25
Torticollis	......	......	......	......	......	......	......	6	6
Facial spasm	......	......	......	......	......	......	......	2	2
Hiccough	1	2	3	......	......	......	......	2	5
Epilepsy	1	28	......	18	7	......	4	22	51
Insomnia	......	......	......	......	......	......	......	10	10
Vertigo	......	1	......	1	......	......	......	12	13
Headache	......	13	5	8	......	......	......	99	112
Hyperesthesia	......	......	......	......	......	......	......	3	3
Anesthesia	......	1	......	1	......	......	......	2	3
Neuralgia	1	42	22	16	2	......	3	291	334
Hysteria	......	11	3	4	4	......	......	6	17
Nervous weakness	1	43	5	32	4	......	3	222	266
Motor aphasia	......	2	......	2	......	......	......	......	2

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE NERVOUS SYSTEM—Continued.									
Mental diseases—									
Mania	11	4		2	1		12	3	18
Melancholia	4	7	2	5	1		3	4	15
Dementia	32	6		2		3	33	3	41
General paralysis of the insane	9	3		1	1	4	6		12
Delusional insanity	4	5		1	3	1	4	2	11
Syphilis, cerebral	2						2		2
DISEASES OF THE EYE	6	101	48	45	7		8	574	681
Conjunctivitis—									
Catarrhal—									
Acute	2	27	15	12	11		1	329	358
Chronic		3	1	2				25	28
Purulent		2		2				1	3
Ecchymosis of conjunctiva								3	3
Edema of conjunctiva								1	1
Chronic hyperemia of conjunctiva								1	1
Degeneration of conjunctiva								1	1
Keratitis		4		3	1			6	10
Ulceration of cornea	1	19	10	10				15	35
Opacity of cornea		2		1	1			6	8
Scleritis								2	2
Congestion of eye								16	16
Iritis		26	11	12	1		2	33	59
Mydriasis		1	1					1	2
Choroiditis								1	1
Glaucoma	1						1		1
Atrophy and degeneration of optic nerve or papilla								1	1
Retinitis		1					1	3	4
Lenticular cataract	1	3		1	1		2	14	18
Detachment of retina		1			1			1	2
Panophtholmitis								2	2
Amblyopia—									
Functional night blindness								9	9
Day blindness								1	1
Temporary blindness								4	4
Ametropia—									
Hypermetrophia		1					1	4	5
Myopia								8	8
Astigmatism								2	2
Chronic darco-cystitis		2	2					3	5
Presbyopia								3	3
Obstruction of nasal duct		1	1					2	3
Blepharitis marginalis		3	1	2				14	17
Sty								48	48
Abscess of eyelid	1	2	3					4	7
Ecchymosis of eyelid		1	1					5	6
Ectropion		2	1		1				2
Oedema of eyelid								2	2
Hyalitis								2	1
Inflammation lacrymal gland								1	1
DISEASES OF THE EAR	6	69	43	27	3	1	1	416	491
Inflammation of the external meatus—									
Acute		7	4	3				40	47
Chronic		1	1					1	2
Abscess		1	1					20	21
Accumulation in external meatus of wax or epidermis		4	1	2			1	150	154
Inflammation of the middle ear—									
Nonsuppurative	2	9	10	1				80	91
Suppurative	4	40	23	19	2			101	145
Within the mastoid cells		2	1			1			2

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE EAR—Contd.									
Ulceration of membrana tympani								3	3
Perforation of membrana tympani		2		1	1			4	6
Necrosis of ossicles								1	1
Anchylosis of ossicles								1	1
Obstruction of Eustachian tube								2	2
Tinnitus		1	1					7	8
Deafness		1		1				5	6
Naevus		1	1					1	2
DISEASES OF THE NOSE	1	45	24	12	4	1	5	574	620
Inflammation of soft parts	1	16	7	6	1		3	487	504
Inflammation of framework—									
Perichondritis		1	1					2	3
Diseases of septum—									
Abscess		1	1					5	6
Deviations		15	9	3	2		1	14	29
Epistaxis		2	2					14	16
Inflammation of the accessory sinuses		8	3	2	1	1	1	10	18
Inflammation of the nasopharynx		2	1	1				42	44
DISEASES OF THE CIRCULATORY SYSTEM	38	373	57	226	22	66	40	459	870
Pericarditis	1	4	4	1				7	12
Endocarditis		8	1	4		2	1	1	9
Valvular disease—									
Aortic	9	63	1	43	4	19	5	25	97
Mitral	14	120	3	83	13	18	17	129	263
Aortic and mitral	4	30	1	23		5	5	17	51
Myocarditis		15		8		6	1	24	39
Degeneration of heart—									
Fatty		1		1				6	7
Fibrous		6		2	1	3			6
Hypertrophy of heart	1			1					1
Dilatation of heart		4		3			1	2	6
Angina pectoris		1		1				2	3
Disordered action of the heart—									
Abnormal slowness		1		1				13	14
Abnormal rapidity		5	2	2	1			40	45
Irregularity		10		8		1	1	32	42
Arteritis	2	8	1	7		2		11	21
Degeneration of arteries—Arteriocapillary fibrosis	2	19		14	2	2	3	19	40
Aneurysm of arteries	3	6	1	2		6		11	20
Obstruction of arteries—Embolism		2				1	1	4	6
Phlebitis		7	1	5			1	6	13
Varix	2	60	42	15	1		4	106	168
Rupture of temporal artery		1				1			1
Thrombosis of veins		2		2				3	5
Syncope								1	1
DISEASES OF THE RESPIRATORY SYSTEM	19	701	381	240	24	42	34	2,388	3,104
Hay fever								11	11
Tracheitis, catarrhal, acute								7	7
Inflammation of mucous membrane of larynx—									
Catarrhal, acute		10	7	2	1			135	145
Catarrhal, chronic		5	1	4				10	15
Membranous		1	1						1

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE RESPIRATORY SYSTEM—Continued.									
Bronchitis—									
Catarrhal, acute	2	189	123	56	7	......	5	1,672	1,863
Catarrhal, chronic	4	115	22	77	8	3	9	271	390
Grinder's asthma	......	......	......	......	......	......	......	5	5
Spasmodic asthma	4	34	6	28	1	1	2	55	93
Congestion of lung	......	2	1	......	......	1	......	18	20
Hemorrhage of lung—Hemoptysis	......	3	1	1	......	1	......	5	8
Pneumonia	3	170	128	15	......	28	2	13	186
Broncho-pneumonia	......	20	14	......	......	3	3	......	23
Abscess of lung	......	1	......	1	......	......	......	1	2
Chronic interstitial inflammation	......	1	......	......	......	1	......	1	2
Phthisis—									
Acute	1	6	......	6	......	1	......	6	13
Chronic	......	6	......	6	......	......	......	3	9
Tubercular	......	4	......	......	3	......	1	6	10
Pleurisy—									
Acute	2	98	67	23	1	1	8	140	240
Chronic	1	16	1	14	......	2	......	19	36
Empyema	2	8	4	3	1	......	2	5	15
Hydrothorax	......	7	4	2	......	......	1	......	7
Adhesions of pleura	......	2	1	1	......	......	......	1	3
Emphysema, versicular	......	3	......	1	1	......	1	4	7
DISEASES OF THE DIGESTIVE SYSTEM	65	1,699	1,216	412	40	24	70	5,455	7,219
Inflammation of the lips	......	......	......	......	......	......	......	5	5
Ulceration of the lips	......	......	......	......	......	......	......	4	4
Fissure of the lips	......	......	......	......	......	......	......	1	1
Inflammation of the mouth	......	1	......	1	......	......	......	25	26
Ulceration of the mouth	......	1	1	......	......	......	......	15	16
Inflammation of the dental pulp	......	......	......	......	......	......	......	1	1
Suppuration of the dental pulp	......	......	......	......	......	......	......	5	5
Caries of dentine and cementum	......	2	1	1	......	......	......	97	99
Necrosis of cementum	......	......	......	......	......	......	......	10	10
Inflammation of dental periosteum	......	2	1	......	1	......	......	4	6
Abscess of dental periosteum	1	10	6	4	1	......	......	37	48
Suppuration of alveoli	......	7	......	6	......	......	1	31	38
Ulceration of gums and alveoli	......	5	1	4	......	......	......	8	13
Caries of the alveoli	......	1	1	......	......	......	......	4	5
Toothache	......	......	......	......	......	......	......	61	61
Retention of deciduous teeth	......	1	......	1	......	......	......	......	1
Ulceration of throat	......	2	......	1	1	......	......	......	2
Inflammation of the tongue	......	......	......	......	......	......	......	3	3
Ulceration of the tongue	......	1	......	1	......	......	......	9	10
Sore throat	......	17	13	3	......	......	1	215	232
Inflammation of tonsils—									
Follicular	3	232	192	36	2	3	2	442	677
Suppuration	......	34	28	5	1	......	......	43	77
Hypertrophy of tonsils	......	15	8	5	......	......	2	8	23
Elongated uvula	......	......	......	......	......	......	......	9	9
Inflammation of salivary glands	......	2	......	2	......	......	......	5	7
Inflammation of the pharynx—									
Catarrhal	1	17	16	......	......	......	2	216	234
Granular	......	1	......	1	......	......	......	26	27
Follicular	......	1	......	......	1	......	......	20	21
Post-pharyngeal abscess	......	1	1	......	......	......	......	......	1
Ulceration of pharynx	......	3	2	1	......	......	......	2	5
Stricture of stomach	......	......	......	......	......	......	......	1	1
Stricture of esophagus	......	3	......	3	......	......	......	......	3
Inflammation of the stomach, catarrhal	6	170	96	68	2	2	8	438	614
Ulceration of the stomach—									
Superficial	1	26	12	10	1	1	3	30	57
Perforating	......	2	1	1	......	......	......	2	4

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Hemorrhage of the stomach		2	2					2	4
Dilatation of the stomach	1	4	1	2	1		1	2	7
Indigestion	4	97	71	27	1	1	1	1,151	1,252
Pyrosis								2	2
Nausea		1	1					2	3
Vomiting								2	2
Gastralgia		1		1				7	8
Heartburn		1			1			4	5
Loss of appetite								52	52
Fistula of intestines		1					1		1
Inflammation of the intestines—									
Enteritis	1	58	49	7		2	1	73	132
Appendicitis	5	117	84	30		2	6	45	167
Colitis	1	13	10	2			2	9	23
Catarrhal		18	13	4			1	42	60
Ulceration of the intestines		3		2			1	1	4
Ulceration of rectum		7	4	2	1			5	12
Fecal accumulation	1	13	12	2				13	27
Hernia	24	293	254	27	17	4	15	402	719
Obstruction of the intestines		6	4	2				2	8
Intestinal dyspepsia	1	9	10					18	28
Constipation		63	40	22	1			889	952
Colic	1	22	19	4				43	66
Diarrhœa		64	51	9			4	378	442
Enteralgia		1	1					4	5
Inflammation of the rectum		5	1	2		1	1	3	8
Periproctitis, abscess	2	25	17	10				17	44
Fissure of the anus		4	4					10	14
Fistula in ano		72	38	25	3		6	50	122
Prolapse of the rectum		4	4					2	6
Biliary fistula								1	1
Yellow atrophy of liver		1				1			1
Piles—									
Internal	5	34	27	10	1		1	71	110
External		50	33	16			1	144	194
Mixed	3	36	28	8	2		1	32	71
Pruritus ani		1	1					17	18
Inflammation of the liver—									
Acute		7	3	3	1			22	29
Acute suppuration		1	1						1
Acute abscess		3		1		1	1		3
Chronic	1	12	1	6		3	4	6	20
Hyperemia of the liver	2	25	21	4				56	83
Degenerations of the liver, fatty		1				1		1	2
Accumulation of bile								9	9
Hypertrophy of the liver								3	3
Jaundice		16	10	6				48	64
Inflammation of the hepatic ducts and gall bladder		27	13	12			2	22	49
Calculi		10	3	7				7	17
Biliary colic		3	2	1				3	6
Inflammation of the peritoneum		3	1	1		1			3
Dropsy	1	2		2			1	6	9
Adhesion of peritoneum		2	1		1				2
Sprue		1		1					1
Concretion of intestines		1	1						1
Inflammation of pancreas		1				1			1
DISEASES OF THE LYMPHATIC SYSTEM	15	360	203	145	11		16	451	826
Hypertrophy of spleen								1	1
Inflammation of lymph glands—Suppuration	13	353	197	143	10		16	410	776
Hypertrophy of lymph glands	2	2	2	1	1			13	17
Inflammation of lymphatics—Suppuration		5	4	1				15	20
Goiter								12	12

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE URINARY SYSTEM	20	238	62	128	13	36	19	471	729
Acute nephritis	1	19	3	7	3	3	4	19	39
Bright's disease									
Chronic nephritis	11	115	14	70	4	25	13	81	207
Granular kidney	1	9		7	1	2		12	22
Hydronephrosis	1		1						1
Glycosuria		2	1	1					2
Pyelitis		6	4	1		1		6	12
Calculus in kidney		1		1				13	14
Calculus in ureter		13	4	8			1	1	14
Suppression of urine		1	1					3	4
Hæmaturia	1	5	2	3		1		13	19
Albuminuria		2	1	1				5	7
Lithuria								2	2
Phosphaturia		1	1					6	7
Hemoglobinuria		2	1	1					2
Inflammation of bladder—									
Acute	3	35	19	17		1	1	151	189
Subacute		3	1	2				33	36
Chronic	1	10		6	2	3		41	52
Calculus of bladder		1		1				7	8
Distention of bladder		2	2						2
Oxaluria								3	3
Irritability of bladder								39	39
Retention of urine	1	6	5	2				15	22
Incontinence of urine		5	2		3			21	26
DISEASES OF THE GENERATIVE SYSTEM	30	884	517	327	28	4	40	1,940	2,854
Urethritis		4	2	2				68	72
Gleet		3	1	2				46	49
Abscess of the urethra		5	1	2	1		1	6	11
Abscess of prostate		3	2	1				3	6
Hemorrhage of the urethra		2	1	1				5	7
Stricture of urethra—									
Organic	5	92	61	25	3	2	6	267	364
Traumatic		2	1	1				5	7
Spasmodic		3	1	1			1	4	7
Urethral fistula	1	6	5	1			1	5	12
Pruritus of scrotum								1	1
Inflammation of the prostate—									
Acute		1		1				14	15
Chronic	1	6		6	1			6	13
Prostatarrhea								5	5
Hypertrophy of the prostate	2	14	3	12		1		48	64
Posthitis		2	1	1				12	14
Phimosis	1	93	82	8	2		2	66	160
Paraphimosis	1	11	6	4			2	10	22
Inflammation of the penis—of the glands		2	1	1				33	35
Abscess of penis		1		1				2	3
Ulcer of penis	5	74	30	43	3		3	239	318
Edema of penis		3	2	1				6	9
Soft chancre of penis	7	231	102	119	4	1	12	685	923
Priapism								2	2
Inflammation of the scrotum		3	2	1				8	11
Abscess of the scrotum		6	3	3				7	13
Hypertrophy of prepuse		2	1				1	3	5
Inflammation of the spermatic cord		1		1				3	4
Hydrocele of the spermatic cord		13	8	5				11	24
Hematocele of the spermatic cord	1	60	44	8	7		2		61
Varicocele	2	25	16	8	2		1	87	114
Hydrocele of tunica vaginalis								40	40
Inflammation of the testicle—									
Acute orchitis	2	102	66	30	3		5	116	220
Chronic orchitis		13	10	3				10	23
Epididymitis	1	90	55	33			3	61	152

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE GENERATIVE SYSTEM—Continued.									
Abscess of testicle		3	2	1				2	5
Spermatorrhœa								18	18
Impotence								12	12
Sloughing of scrotum		1	1						1
Inflammation of the ovary		2	2					6	8
Inflammation of the fallopian tube								2	2
Inflammation of the uterus		2	2					1	3
Prolapse of vagina								1	1
Abrasion of uterus								1	1
Inflammation of breast								2	2
Abortion		1	1		2				1
Displacements and distortions of the uterus		1	1					3	4
Amenorrhœa	1		1					1	2
Dysmenorrhœa		1		1				2	3
Menorrhagia								2	2
Leucorrhœa								3	3
DISEASES OF THE ORGANS OF LOCOMOTION	15	343	199	118	16	2	23	1,340	1,698
Inflammation of the bones—									
Osteitis		21	9	8	1		3	18	39
Periostitis		7	4	2	1			19	26
Caries	1	5	3	3				2	8
Necrosis	3	15	5	10	1		2	18	36
Hypertrophy of the bones		1		1					1
Inflammation of joints—									
Acute synovitis	1	38	18	16	1		4	33	72
Chronic synovitis	1	11	7	5				27	39
Suppuration		7	6	1				12	19
Ankylosis	1	10	6	3	1		1	4	15
Dislocation of articular cartilage		3	2		1			1	3
Loose body in joint		1	1					2	3
Dislocation of joint	1	3	2	2				3	7
Abscess of bone								1	1
Inflammation of spine		1			1				1
Caries of the spine	1			1				1	2
Psoas, lumbar, and other abscesses		3		1	1		1		3
Posterior curvature of spine		3		1	1	1			3
Posterior curvature of spine, angular		2		2				2	4
Lateral curvature of spine		2					2	3	5
Anterior curvature of spine								1	1
Inflammation of muscles		1		1				9	10
Suppuration of muscles								4	4
Idiopathic muscular atrophy								1	1
Myalgia—									
Lumbago	3	142	100	40	1		4	1,006	1,151
Stiff neck								15	15
Inflammation of fasciæ								2	2
Contracture of fasciæ		2	2					2	4
Inflammation of tendons		4	3	1				9	13
Contraction of tendons		3	1	2				7	10
Dislocation of spinal column		1			1				1
Inflammation of sheaths of tendons	1	10	8	1		1	1	17	28
Thecal abscess		3	1	2				2	5
Ganglion		4		2	1		1	4	8
Inflammation of bursæ—									
Acute	1	18	15	4				45	64
Chronic		3		1	1		1	11	14
Abscess of bursæ		3	1	2				2	5
Bunion	1	2	1		1		1	11	14
Bursal cyst								5	5
Flat foot		8		5	1		2	39	47
Hammer toe		4	2	1	1				4
Hallux volgus		2	2						2
Club foot								2	2

Table IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Local diseases—Continued.									
DISEASES OF THE CONNECTIVE TISSUE	12	374	228	133	3	1	21	927	1,313
Inflammation	6	154	90	60	2	......	8	558	718
Abscess	4	213	131	72	1	1	12	361	578
Gangrene	1	5	5	......	......	......	1	......	6
Œdema	1	1	2	......	......	......	......	5	7
Elephantiasis	......	1	......	1	......	......	......	1	2
Undue formation of fat	......	......	......	......	......	......	......	2	2
DISEASES OF THE SKIN	33	418	233	187	14	4	13	2,414	2,865
Erythema	......	4	2	2	......	......	......	33	37
Pityriasis rosea	......	1	......	1	......	......	......	1	2
Urticaria	......	10	9	1	......	......	......	61	71
Prickly heat	......	2	2	......	......	......	......	26	28
Eczema	1	38	20	17	2	......	......	372	411
Impetigo	......	9	7	2	......	......	......	33	42
Pityriasis rubra	......	3	2	1	......	......	......	8	11
Prurigro	......	......	......	......	......	......	......	4	4
Lichen	......	......	......	......	......	......	......	1	1
Psoriasis	2	14	8	7	......	......	1	44	60
Herpes	1	9	9	1	......	......	......	100	110
Zona	2	10	10	2	......	......	......	49	61
Pemphigus	......	1	1	......	......	......	......	5	6
Dermatitis herpetiformis	......	4	3	1	......	......	......	28	32
Acne	......	2	......	2	......	......	......	121	123
Gutta rosea	......	1	......	1	......	......	......	......	1
Sycosis	......	......	......	......	......	......	......	13	13
Seborrhea	......	1	......	1	......	......	......	14	15
Ichthyosis	......	......	......	......	......	......	......	2	2
Area	......	1	......	1	......	......	......	2	3
Sudamina	......	......	......	......	......	......	......	5	5
Cholasma	......	......	......	......	......	......	......	3	3
Alopecia	......	......	......	......	......	......	......	4	4
Chilblain	......	......	......	......	......	......	......	2	2
Ulcer	21	175	77	96	8	4	11	612	808
Cicatrices	......	......	......	......	......	......	......	1	1
Boil	4	66	45	24	......	......	1	536	606
Carbuncle	2	34	24	12	......	......	......	136	172
Whitlow	......	7	2	5	......	......	......	66	73
Onychia	......	15	5	8	2	......	......	51	66
Corn	......	2	1	......	1	......	......	24	26
Cheloid	......	......	......	......	......	......	......	5	5
Wen	......	9	6	2	1	......	......	22	31
Hyperidrosis	......	......	......	......	......	......	......	2	2
Pruritus	......	......	......	......	......	......	......	19	19
Lupus	......	......	......	......	......	......	......	1	1
Tylosis	......	......	......	......	......	......	......	4	4
Bromidrosis	......	......	......	......	......	......	......	3	3
Amdrosis	......	......	......	......	......	......	......	2	2
Injuries.									
GENERAL INJURIES	7	113	76	28	2	6	8	244	364
Effects of heat—									
Burns and scalds	4	51	34	15	1	3	2	174	229
Heat stroke	3	37	29	7	1	......	3	18	58
Sunstroke	......	......	......	......	......	......	......	3	3
Effects of cold	......	2	1	......	......	1	......	4	6
Effects of chemical irritants and corrosives	......	1	1	......	......	......	......	12	13
Multiple injury	......	17	7	6	......	1	3	17	34
Suffocation	......	1	1	......	......	......	......	......	1
Privation—Starvation	......	1	1	......	......	......	......	......	1
Exhaustion	......	2	2	......	......	......	......	15	17
Shock	......	1	......	......	......	1	......	1	2
LOCAL INJURIES	114	2,345	1,454	834	48	19	103	6,572	9,031
Wound of ulna nerve	......	1	......	1	......	......	......	......	1
Compression of nerves	......	2	......	2	......	......	......	1	3
Contusion of muscles	......	4	1	3	......	......	......	13	17
Strain of muscles	......	18	11	7	......	......	......	147	165

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Injuries—Continued.									
LOCAL INJURIES—Continued.									
Rupture of muscles		1	1					2	3
Wound of muscle		1	1						1
Strain of tendons		6	1	5				5	11
Rupture of tendons	1	1		2				1	3
Wound of tendons		1	1						1
Contusion of skin								13	13
Abrasion of skin		2	1	1				90	92
Wound of skin		14	8	6				75	89
Burn or scald of skin	8	111	62	50	1	3	3	270	389
Frostbite		23	15	8				35	58
Effects on the skin of irritants or corrosives		3	1	1			1	3	6
Abrasion of mucous membrane		1	1					11	12
Wound of mucous membrane								1	1
Burn or scald of mucous membrane		3	3					5	8
Effects on the mucous membrane of irritants or corrosives								5	5
Contusion of scalp	1	9	6	4				20	30
Wound of scalp	1	87	61	26			1	249	337
Contusion of skull		8	6	2				3	11
Fracture of the vault of skull		4	2	2				1	5
Fracture of the base of skull		2				2			2
Wound of skull		4	1	3				2	6
Concussion of brain	1	15	10	5		1		3	19
Contusion of face		21	8	13				54	75
Wound of face and mouth		52	33	17	2			171	223
Fracture of facial bones	2	35	24	10	1		2	12	49
Dislocation of nasal cartilages		2	2					2	4
Dislocation of lower jaw		1	1						1
Burn or scald of mouth		1		1				2	3
Contusion of eyelid		3	3					11	14
Wound of eyelid		9	7	2				19	28
Subconjunctival hemorrhage								2	2
Chemical injury to eye								1	1
Wound of conjunctiva								5	5
Contusion of eyeball		8	6	2				14	22
Foreign bodies in the conjunctiva or cornea		5	3	2				127	132
Foreign body in eyeball		1		1				18	19
Wound of eyeball	1	4	2	1	1		1	8	13
Contusion of pinna								5	5
Wound of pinna		6	4	1			1	15	21
Rupture of membrana tympani								2	2
Wound membrana tympani								1	1
Foreign body in external meatus								4	4
Rupture of trachea								1	1
Fracture of spine with injury to the cord		1			1				1
Gunshot wound		16	8	5		2	1	2	18
Contusion of neck		6	2	4				2	8
Wound of neck		3	1	1		1		2	5
Foreign body in the air passages								1	1
Foreign body in the food passages								2	2
Fracture of spine with displacement	2						2		2
Contusion of chest		35	16	18			1	156	191
Dislocation of costal cartilages								2	2
Fracture of ribs	3	113	66	44	1	1	4	108	224
Fracture of sternum		1	1						1
Wound of parietes of chest	1	4	4	1				6	11
Penetrating wound of pleura or lung		1	1						1
Contusion of back	1	55	42	14				117	173
Sprain of back	1	29	18	12				118	148
Wound of back		3	3					7	10
Fracture of spine		4		2		2		4	8

TABLE IV.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1914*—Continued.

Diseases.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Injuries—Continued.									
LOCAL INJURIES—Continued.									
Concussion of cord		1		1				1	2
Contusion of abdomen		14	11	2	1			20	34
Wound of parietes of abdomen		5	3	2				12	17
Contusion of the pelvis		5	5					3	8
Contusion of the perinæum, scrotum, or penis		1	1					4	5
Wound of the male urethra, perinæum, scrotum, testis, or penis	1	8	9					21	30
Rupture of urethra	1	1	1			1			2
Fracture or dislocation of pelvic bones	1	3	3			1			4
Mutilation of genitals								1	1
Contusion of testicle		3	1	2				15	18
Contusion of upper extremities	2	103	48	48	5		4	492	597
Sprain of shoulder		1					1	39	40
Sprain of elbow		6	5	1				18	24
Sprain of wrist		34	17	14	1		2	148	182
Sprain of hand		1	1					29	30
Sprain of thumb		2	1	1				5	7
Sprain of fingers								12	12
Wound of upper extremities	9	331	227	101	2		10	1,677	2,017
Wound of joint, upper extremities		3	3					15	18
Fracture of clavicle		29	15	11	1		2	12	41
Fracture of scapula		4	2	2				3	7
Fracture of humerus	6	19	16	9				14	39
Fracture of bones of forearm—									
Radius		31	17	10	2		2	15	46
Ulna	1	12	7	4	1		1	10	23
Both bones	3	25	12	10	2		4	13	40
Fracture of carpus, metacarpus, or phalanges	1	35	18	15	3			88	124
Dislocation of clavicle		5	4		1			3	8
Dislocation of scapula		2	1	1					2
Dislocation of humerus	3	22	20	3			2	14	39
Dislocation of radius and ulna		2	1	1				1	3
Dislocation of phalanges of thumb		2	1	1				12	14
Dislocation of phalanges of fingers	1	1	1	1				8	10
Dislocation of ulna		4	2	2					4
Dislocation of metacarpal bones		3		3					3
Dislocation of carpal bones		1	1						1
Dislocation of wrist								2	2
Contusion of lower extremities	9	249	140	105	6	1	6	439	697
Sprain of hip		3	2	1				13	16
Sprain of knee	1	21	12	9			1	51	73
Sprain of ankle	5	125	83	42			5	179	309
Sprain of foot		14	9	4			1	8	22
Internal derangement of joints								3	3
Wound of lower extremities	12	243	153	79	10	2	11	438	693
Wound of joint, lower extremities		8	7	1				13	21
Fracture of femur	8	34	19	12	1	2	8	5	47
Fracture of patella	1	6	5	1					7
Fracture of tibia	8	50	38	14			6	14	72
Fracture of fibula	4	34	23	9	2		4	7	45
Fracture of tibia and fibula	10	41	22	18	1		10	3	54
Fracture of bones of foot—									
Of the tarsus		1	1						1
Of the metatarsus	2	17	10	6	1		2	17	36
Of the phalanges of the toes		24	15	4	1		4	6	30
Dislocation of femur	1	3	2	2					4
Dislocation of tibia		1		1					1
Dislocation of fibula		1	1						1
Dislocation of foot		3	3						3
Dislocation of metatarsus and phalanges	1	1						3	5
Malinger		7	7					11	18
Vaccinations								699	699

TABLE V.—*Comparative exhibit—Ratio of deaths from specific causes, 1905–1914.*

Deaths from—	General average.	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
General diseases	49.39	53.46	51.52	52.17	44.92	50.00	49.03	41.90	50.80	51.89	48.24
Diseases of the—											
Nervous system	6.00	6.32	4.87	6.72	5.06	6.51	3.67	5.18	8.50	6.75	6.39
Circulatory system	11.92	11.88	11.16	10.47	12.06	8.74	13.39	15.12	11.04	10.81	14.53
Respiratory system	11.06	8.81	9.13	11.06	13.42	9.87	13.60	14.90	10.35	10.27	9.25
Digestive system	6.06	4.79	5.88	5.34	4.67	10.08	7.13	5.83	6.44	5.13	5.28
Genito-urinary system	7.06	5.74	6.09	5.54	10.13	7.85	4.97	8.86	7.59	5.94	7.93
Injuries	6.76	7.09	9.13	7.12	7.20	5.61	7.34	6.26	4.37	8.01	5.52
From all other causes	1.74	1.91	2.22	1.58	2.54	1.34	.87	1.95	.91	1.20	2.86

TABLE VI.—*Nativity of patients treated in hospital during the fiscal year ended June 30, 1914.*

Countries.	Number.	Countries.	Number.
Africa	11	India	7
Alaska	3	Ireland	601
Arabia	3	Isle of Man	1
Argentine Republic	4	Italy	78
Antigua	1	Jamaica	35
Australia	28	Japan	31
Austria-Hungary	123	Java	1
Brazil	2	Korea	4
Barbados	6	Madeira Islands	1
Bahama Islands	9	Malta	1
Belgium	33	Mexico	27
Bermuda	1	New Brunswick	11
Bohemia	10	New Foundland	78
British Guiana	5	New Zealand	13
British West Indies	63	Nicaragua	1
British Honduras	2	Norway	1,005
British East Indies	1	Nova Scotia	123
Canada	167	Panama	2
Cape Verde Islands	90	Paraguay	1
Cape Colony	1	Peru	9
Canary Islands	1	Philippine Islands	23
Cape Briton	13	Porto Rico	43
Ceylon	2	Portugal	137
Chile	16	Prince Edward Island	9
China	7	Roumania	4
Costa Rica	2	Russia	303
Columbia	2	Saba Islands	2
Crete	1	St. Croix	1
Curacao	10	St. Barthelemy	2
Cuba	6	St. Thomas	2
Danish West Indies	14	St. Vincent Island	1
Denmark	258	Servia	4
Demerara	1	Scotland	202
Dutch Guiana	4	Syria	1
Ecuador	5	Spain	260
Egypt	2	Sweden	818
England	489	Switzerland	36
Finland	325	Tasmania	2
France	71	Turkey	8
Germany	838	Trinidad	3
Grand Cayman	8	United States	7,617
Greece	96	Uruguay	1
Greenland	2	Venezuela	2
Guam	3	Wales	16
Hawaiian Islands	27	West Indies	107
Holland	60		
Iceland	9	Total	14,469

Surgical operations, fiscal year 1914.

Operations.	Cases.
Total number of operations	2,450
Postoperative mortality	41
TUMORS: Excision of	51
Sarcoma	18
Osteoma	1
Carcinoma	9
Lipoma	2
Myxo-sarcoma	1
Papilloma	8
Condyloma	3
Fibroma	9
CYSTS: Excision of	24
Breast	2
Face	2
Hand	1
Knee	1
Neck	1
Scalp	1
Eyelid	1
Dermoid	1
Sebaceous cyst	14
FOREIGN BODIES: Removal from	13
Finger	2
Cornea	3
Foot	3
Conjunctiva	2
Air passages	1
Knee joint	1
Buttock	1
ABSCESSES: Incision and drainage	62
Perineum	8
Axilla	6
Jaw	3
Scrotum	6
Chest	2
Face	4
Back	1
Neck	4
Buttock	1
Upper extremity	16
Lower extremity	12
BLOOD VESSELS	788
Arteries—ligation to control hemorrhage	3
Veins—	
For varix—	
Ligation	5
Phlebectomy	19
Mayo operation	2
Schele operation	5
Intravenous injection of—	
Salvarsan for syphilis	78
Neosalvarsan—	
For syphilis	671
For pernicious anemia	3
Dropsy—tapping	2
NERVES	5
Stretching	2
Suturing	3
LYMPHATIC GLANDS	115
Incision and drainage for—suppuration—	
Cervical	5
Femoral	8
Inguinal (bubo)	102

Operations.	Cases.
SKIN AND SUBCUTANEOUS TISSUE	98
Incision and drainage for—	
Inflammation	8
Cellulitis	11
Wound, infected	15
Wound, lacerated	6
Curretage for ulcer	5
Excision of condyloma	3
Operation for onychia	9
Skin grafting for—	
Chronic ulcer	5
Wound	4
Suture and dressing for wound of—	
Face	3
Scalp	8
Lower extremity	7
Upper extremity	14
BONES	121
Simple fracture:	
Reduction, splints, or extension—	
Radius	3
Tibia	9
Metacarpus	5
Astragalus	1
Tibia and fibula	5
Clavicle	2
Phalanges	4
Rib	4
Radius and ulna	1
Femur	3
Patella	3
Maxilla, superior	1
Maxilla, inferior	5
Ulna	2
Fibula	3
Bones exposed and wired—	
Patella	4
Inferior maxillary	1
Radius	2
Bones exposed and loose fragments removed—	
Skull	2
Tibia and fibula	3
Femur	1
Bones exposed, Lane's plates applied—	
Tibia and fibula	3
Femur	1
Maxilla, inferior	1
Humerus	5
Tibia	1
Bone graft	2
Compound fracture—	
Reduction, wiring, and splint—	
Femur	2
Fibula	1
Maxilla, inferior	3
Tibia	3
Tibia and fibula	1
Unclassified	2
Resection or curetage of portion of bone for injury, dressing—	
Ulna and radius	1
Femur	4
Rib	2
Tibia	3
Humerus	2
Maxilla, superior	1
Maxilla, inferior	5
Sternum	1
Phalanges	3
Clavicle	1
Radius	2
Unclassified	7

Surgical operations, fiscal year 1914—Continued.

Operations.	Cases.
JOINTS	46
Reduction of dislocation of—	
Humerus	15
Clavicle	3
Metatarsal	4
Phalanges	2
Hip	2
Maxilla, inferior	3
Ulna	1
Arthrotomy and drainage—	
Knee	5
Patella	1
Unclassified	4
Arthrotomy—	
Removal of loose cartilege	3
Knee	1
MUSCLES, TENDONS, AND FASCIA	6
Tenonhophy	3
Tenotomy	1
Ligation of tendon	2
BURSEA	10
Incision and drainage for—	
Inflammation	7
Excision	3
AMPUTATIONS	65
For disease or injury of—	
Finger	39
Arm	6
Leg	7
Toes	11
Foot	2
SKULL	8
Trephining for—	
Fracture	4
Mastoditis	3
Necrosis of bone	1
FACE, NASAL CAVITIES, AND MOUTH	41
Excision of—	
Nasal septum	8
Turbinates	1
Adenoids	3
Nasal polypus	2
Extraction of teeth	5
Incision and drainage for—	
Suppuration of alveola	1
Suppurative tonsillitis	4
Tonsillectomy	17
EYES	13
Extraction of lense, for cataract	2
Enucleation of eyeball, for injury	1
Excision of pterygium	3
Extraction of foreign bodies	2
Incision of chalazion	2
Incision of lacrimal gland	1
Irredectomy for glaucoma	2
EAR	4
Perforation of membrana tympani, for suppuration of otitis media	3
Excision of bone, for cyst of antrum	1
THORAX	25
Thoracentesis, for—	
Empyema	9
Pleurisy	10
THORAX—Continued.	
Resection of rib, for—	
Empyema	2
Necrosis of bone	3
Abscess of liver	1
ABDOMEN	315
Abdominal section, for—	
Appendectomy, closure	52
Appendectomy, drainage	14
Drainage, abscess of liver	1
Cholecystotomy, drainage	7
Enterorrhaphy, for typhoid perforation	5
Laparotomy, for—	
Hemorrhage of pancreas	1
Inflammation of stomach	1
Peritonitis, tubercular	3
Peritonitis	2
Exploration, for—	
Gastrectomy	1
Ulcer of stomach	2
Obstruction of intestines	2
Parancentesis of abdomen, for ascites	3
Gastrorrhophy, for gastric ulcer	1
Hernioplasty, for—	
Inguinal hernia—	
Bassini operation	167
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Ferguson	15
Halsted	3
Andrew's operation	4
Unclassified	8
Strangulated hernia	3
Umbilical hernia	1
RECTUM AND ANUS	164
Fistula in ano—	
Excision	17
Incision	35
Unqualified	11
Hemorrhoids—	
External—	
Clamp and cautery	26
Excision	27
Incised and curreted	3
Internal—	
Clamp and cautery	2
Excision	3
Mixed—	
Excision	7
Clamp and cautery	5
Incised and curreted	2
Dilated sphincter	3
Incision and drainage, for—	
Periprocititis of rectum	4
Rectal abscess	4
Ischiorectal abscess	14
Vesicorectal fistula, plastic operation	4
URINARY BLADDER	3
Distention of bladder, tapping	1
Suprapubic cystotomy, for calculus	2
URETHRA	32
Organic stricture—	
Gradual dilatation	11
Rapid dilatation	1
External urethrotomy	6
Meatotomy	3
Abscess of urethra, incised and drained	1
Cholecystotomy, for calculus in ureter	2
Retention of urine, sound dilatation	1
Lithotomy, for extravasation of urine	1
Urethrotomy, for retention of urine	2
Perineal section, for rupture of urethra	1

Surgical operations, fiscal year 1914—Continued.

Operations.	Cases.
URETHRA—Continued.	
Incision and drainage, for periurethral abscess	1
Suture of bladder, for vesical fistula	1
MALE ORGANS OF GENERATION	343
Penis—	
Circumcision, for—	
Phimosis	151
Paraphimosis	8
Elongated prepuse	1
Soft chancre	1
Ulcer of penis	13
Dorsal incision, for—	
Phimosis	32
Paraphimosis	1
Inflammation of the glands	2
Amputation, for phagedema	1
Epididymotomy	22
Enunculation for enlarged prostate	1
Excision of spermatic cord	1
Bubo—	
Inguinal adenectomy	1
Incised and drained	11
Enunculated	3
Aspiration and injection	1
Operation for orchitis—	
Castration	1
Incised and drained	1
Operation for hydrocele—	
Incised and sutured	9
Bottle operation	7
Andrew's operation	2
Volkman's operation	1
Tapping and injection of iodine emulsion	3
MALE ORGANS OF GENERATION—Contd.	
Penis—Continued.	
Prostate—	
Incision and drainage, for abscess	1
Urethrotomy, for suppuration	1
Operation for varicocele—	
Ligation and cutting veins	37
Phlebectomy	9
Bottle operation	2
Bevan operation	6
Castration, for—	
Undecended testicle	1
Tuberculosis of epididymus	1
Tuberculosis of testicle	7
Incision and curetting, for—	
Sloughing of scrotum	1
Inflammation of scrotum	1
CARBUNCLE	5
Incision and curetting	4
Unqualified	1
GUNSHOT WOUNDS	7
Arm	2
Hip	1
Leg	1
Abdomen	2
Chest	1
GANGRENE	4
Amputation of—	
Toes	2
Foot	1
Leg	1

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